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CONCEPT OF MATTER IN JAINA PHILOSOPHY

J. C. SIKDAR

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Editor
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Concept of Matter in JAINA PHILOSOPHY

By

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Dedicated

to

My Late Ācāryas

Prof. Satyendra Nath Bose

Prof. Dr. Dharendra Mohan Datta

Publisher's Note

We feel immense pleasure indeed in presenting this valuable work—'The Concept of Matter in Jaina Philosophy' by Dr. J. C. Sikdar in the hands of the scholars. It is also a *matter of honour for us that on this work the author was awarded D. Litt Degree by Jabalpur University, Jabalpur.*

Jaina Ācāryas have contributed to almost all the branches of the knowledge including Physical sciences also but unfortunately this aspect remained unexplored. No serious attempt has been made by scholars in this specific field. It is gratifying that this subject is for the first time exhaustively dealt by Dr. J. C. Sikdar. The beauty of this work lies in its searching analysis and critical and comparative approach to various problems related to the concept of Matter in Indian thought—philosophical as well as scientific. Through this work author has really made a valuable contribution to Indian Scientific thought in general and Jainism in particular. We hope that this work will serve as a landmark and will succeed in arousing the interest of the scholars in the field.

We are extremely grateful to Dr. J. C. Sikdar for allowing P. V. Research Institute to publish this work.

We express our deep sense of gratefulness to Sādhvī Śrī Mṛgāvati Śrī Jī for arranging a grant of Rupees Seven thousand for publication of this work in the memory of Pūjya Sādhvījī Śrī Śīlavatījī Mahārāja Sāhiba.

We are thankful to Dr. Arun Pratap Singh, then Research Associate, P. V. Research Institute and other academic staff of the Institute who have helped in one way or the other in the publication of this work.

We are also thankful to Sri Mahesh Kumar of Divine Printers who has been very instrumental in proof-reading and printing of the book.

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SĀDHVĪ ŚRĪ ŚĪLAVATĪJĪ

Twenty fourth Tirthaṅkara Lord Mahāvīra, being an advocate of the cause of spiritual upliftment of women, included nuns and lay-women in his four-fold Order. Consequently, a great number of women excelled themselves in austerities and spiritual development and stood at par with monks in learning and prominence. From the time of Mahāvīra to present age the nuns have always outnumbered the monks. In the recent past revered Ācārya Vallabha Sūri also laid great emphasis on the spiritual upliftment of the nuns of his order. Among his nun-disciples puṇyā Sādhvī Śrī Śīlavatījī was an intelligent, vigilant and of sound character.

She was born at village Ranaparada in Saurashtra, the land of saints and heroes. Her earlier name was Śivakunwar Bahen. From early childhood she was very religious in her temperament. She was married to Shri Dūṅgarasībhai of Saradhāra. Her family life was quite harmonious and the couple had everything at their disposal required for leading smooth and comfortable life. They had two sons and two daughters. But unfortunately, the ruthless axe of destiny fell on her and Dūṅgarasībhai departed in 1927 A. D. Bereaved Śivakunwar Bahen had to bear the responsibility of bringing up her children. Already broken with a miserable widowhood she was struck with another severe blow when her two issues—a daughter and a son passed away in 1928, within a year of her husband's demise. A final stroke she received when her only remaining son also expired.

Having realised the futility of this mortal world. She yearned for renunciation of the world and decided to lead an ascetic life. She was initiated with her only living daughter in 1928 at Śatrunjaya Hill and started her new life as a nun with

her daughter-disciple, who became a renowned Jaina Sādhvī Mahattarā Mṛgāvatī Śrījī. Āryā Śīlavatījī devoted herself to the study of spiritual texts and religious practices. Though her knowledge about the canonical Prākṛta texts was not much deeper yet she had sound knowledge of Jaina works composed in Gujarati. She was well versed in telling religious short stories. She made special arrangements for the study of her daughter-disciple, Sādhvī Śrī Mṛgāvatījī under the supervision of Pt. Sukhalalji and Pt. Becharadasji. Sādhvī Śrī Śīlavatījī toured all over Gujarat and Punjab. The people of Punjab had a great respect for her. When the Golden Jubilee celebrations of Mahāvīra Jaina Vidyālaya, Bombay, founded by her guru Pūjya Vijayavallabha Sūrijī, were accomplished, she left for heavenly abode on 17. 2. 1968 at the age of 69.





Pujya Sādhvī Śrī Śilavatī Śrījī

Dīkṣā 1928

1968 AD.

PREFACE

The Concept of Matter has been treated by every system of thought in its own way from the noumenal and phenomenal aspects as it exists in space and continues in time with all its qualities and modes. This subject has not so far been exhaustibly studied from the metaphysical and physical points of view on the basis of the sources of both the Jaina Āgamas and the post-āgamic works, although Dr. B. N. Seal, Prof. G. R. Jain, Śrī Mohanlal Banthia, Dr. Harisatya Bhattacharya and other scholars made brief appraisal of it in their respective works—‘The Positive Sciences of the Ancient Hindus’, ‘Cosmology—Old and New’, ‘Jaina Padārtha Vijñāna men Pudgala’ and ‘Reals in the Jaina Metaphysics’ in course of their studies in Jaina thought on this problem.

In the āgamic period the Jaina conception of Matter formed the foundation-stone of Jaina physics in a nascent form on a metaphysical basis. On it a superstructure of ‘Concept of Matter in Jaina Philosophy’ had been raised in the post-āgamic period which commenced with the time of Umāsvāti and continued through out the period of the later Jainācāryas. It has been much developed in the light of the concept of Matter as embodied in other Indian philosophies with the progress of speculative thought, having kept in view the historical background of all their notions on this subject.

In Jaina philosophy, Matter has been analysed on the basis of its conception as a permanent substance possessing infinite qualities and modes with many unique notions about it as found in the physical sciences. The Jaina concept of Matter is flexible to some extent, as is shown by its comparative study with the concepts of Matter in physics and metaphysics where it has passed through a series of developments into a meaningful stage of dynamic reality of the present day.

A study of ‘Concept of Matter in Jaina Philosophy’ throws

an important light upon many problems of Indian philosophy and thought, and more particularly in the field of the physical sciences by revealing its various aspects, such as, conception of Reality—Substance, quality and mode (*Dravya-guṇaparyāya*) and their inter-relation, nature of Reality, categories of Reality, concept of Matter, its elements, *Indriyas* (sense-organs), *karma* (Karmic matter) and *leśyā* (condition of soul), and atomism, properties of Matter, its effects and modifications, and classification, atomic structure and properties of atom, transformation of Matter, its combination and value of the Jaina concept of Matter.

The structure of the thesis on the subject 'Concept of Matter in Jaina Philosophy' has been divided into ten chapters. The first chapter deals with the concept of Matter with an introduction by throwing light on the Jaina conception of Reality—*Dravya* (substance), *guṇa* (quality) and *paryāya* (mode) and their inter-relation, nature of Reality and its categories in brief with a comparative study of these problems as treated in other Indian systems of thought and western philosophy, revealing similar views on them. With this background the topic has been discussed in the subsequent chapters in the light of the concept of Matter as embodied in other Indian metaphysics and the physical sciences as far as possible to explain and interpret the metaphysical and physical aspects of the Jaina concept of Matter in an approach to them by a comparative study of the whole problem.

The universe is a system of reals, all inter-related with one another from the points of view of *dravya* (substance), *kṣetra* (locus or field), *kāla* (time) and *bhāva* (condition) having a unity comprising the plurality of interdependent and inter-connected substances. *Dravya* (Substance) means Reality characterized by *Sat* (existence), endowed with *guṇa* (quality) and *paryāya* (mode) and coupled with *utpāda* (origination), *vyaya* (decay) and *dhrauvya* (permanence). The undivided whole of infinite qualities and modes only is conceived as *Dravya* (Substance), i.e. a collective whole of each individual

paryāya (mode) and of such capacities is called Dravya from the point of view of difference among them. But Dravya is guṇaparyāyavat from the point of view of non-difference among them because of paryāya being like their own causative guṇas and guṇas being like Dravya. That is to say, Dravya, guṇa and paryāya are different from one another from the subjective point of view, but non-different from the objective point of view.

Thus Dravya (Substance) is the crux of Jaina Metaphysics and Physics in particular and a central theme of some Indian systems of thought in general, while substance (i.e. Dravya) is the pivotal point of philosophy of Spinoza and Prof. Bertrand Russel. It was natural for the Jainācāryas to begin their metaphysical inquiry into the problem with the notion of Dravya, a notion which has a continuous history in Jaina philosophy from its very beginning upto the present time as is found in the case of notion of substance from Aristotle to Descartes.

The Jaina concept of Dravya compares well with that of substance of Spinoza, the central theme of his metaphysics, "A substance, all of whose attributes and modifications can be deduced from its own essential nature, and all whose attributes are necessary and not contingent, can be described as cause of itself, (cause sui) and only such a substance can be so described". Prof. Bertrand Russel defines a substance as "that which can only enter into a proposition as subject, never as predicate or relation. Metaphysically, substances have generally been held to be indestructible."

According to Jaina metaphysics, an entity has got two aspects—permanent and non-permanent, static and dynamic. It undergoes change without giving up its essential nature. In the experience of life all entities appear to be permanent-in-change. Dravya as Reality has two aspects—permanent and non-permanent. If Jivadravyas (living substances) and Ajivadravyas (non-living substances) were devoid of modifications, there would have never occurred the variabilities in the Universe as a united form of these two realities. Hence the principle of per-

manence-in-change in Dravya is conceived by Jaina metaphysics as logical. Sat is the differentia of Dravya, characterized by origination, decay and permanence. It is an objective reality and the highest universal because of being a unifying principle of all existents under the concept of 'being-existent' on a common objective foundation of existence itself. Therefore, the nature of Dravya—Reality—is that it is characterized by origination, decay and permanence.

The Concept of Dravya has been studied from the noumenal and phenomenal points of view in the light of the doctrine of manifoldness. Dravya has been conceived by the Jainas as a universal principle of Reality from the aspect of generality, while its particular characteristics are Jīvadṛavya (living substance) and Ajīvadṛavya (non-living substance) from the particular aspect. Except the extreme views of monistic materialism of the Cārvākas and monistic spiritualism of the Vedānta, other Indian systems of thought have accepted two aspects of Reality, viz. Cetanatattva (sentient principle) and Acetanatattva (non-sentient principle). It is to be noted that Jīvadṛavya and Ajīvadṛavya of Jaina philosophy do not form any two substance-doctrine, representing the world of animated substances and non-animated substances as independent and self-contained systems. According to a similar concept of a unique substance, "thinking substance and extended substance are one and the same substance, comprehended now under this attribute, now under that."

In accordance with the Jaina conception of Reality having Jīvatattva (sentient principle) and Ajīvatattva (non-sentient principle) as its two aspects, six substances have been accepted as six categories of Reality, viz. Jīva (Soul), Dharma (Principle of motion), Adharma (Principle of rest), Ākāśa (Space), Pudgala (Matter) and Kāla (Time), from the point of view of their respective natures. Nava dravyas (nine substances) of the Vaiśeṣika philosophy, viz. earth, water, fire, air, space, time, direction, soul and mind, can be reduced to Ṣaṭ-dravyas (six substances) of Jaina metaphysics. They are the constituents

of the Universe. The five extended substances (pañcāstikāyas—Principle of motion up to Matter) and Time (kāla)—the sixth substance are permanent in their nature and fixed in number as the sole constituents of the Universe. All except Matter are non-corporeal, i. e. they are not endowed with its characteristics—colour, taste, smell and touch, etc. In the midst of the series of eternal and infinite changes occurring in them, they persist as substances—permanent-in-change (pariṇāmīnitya-dravyas), for they are eternal, independent and permanent categories of Reality from the substantial point of view, yet they are also changing in nature from the modal point of view.

Dharmāstikāya and Adharmāstikāya (principles of motion and rest) are the neutral and conditional causes of motion and rest respectively of Jīva (Soul) and Pudgala (Matter). Ākāśa is that which functions as locus in which other substances manifest themselves or exist with their respective modes without exception or itself gives room to them. Jīva (Soul) is a colourless, smellless, tasteless and touchless, non-corporeal, living eternal and permanent and constant substances of the Universe, having an attribute of consciousness. Pudgala is conceived as a permanent substance as well as stuff of which the material universe is constituted, undergoing changes by the process of integration and disintegration. Kāla (Time) is accepted as an objective reality. It is one substance having an infinite number of moments as its states. It is constitutionally dynamic in the sense that it changes into moments by virtue of its intrinsic constitution like other substances. The concept of time as mode is inspired by the modal point of view, for it is opined that moments emerge and perish without relation to any underlying continuing substance.

Bhūta of the Cārvākas, Prakṛti of the Sāṃkhya-Yoga, Jada-dravya of the Nyāya-Vaiśeṣika and the Mīmāṃsakas, Rūpa of the Buddhists, Māyā of the Śāṅkara-Vedānta, Acit of the Rāmānuja-Vedānta and Pudgala of Jaina philosophy are only diverse views on the subject—Matter.

A comparative study of the Jaina concept of Matter with those of other Indian systems of thought and the physical sciences reveals that it comes nearer to the concept of Matter of the physical sciences, as it is conceived as the substance in the sense of stuff of which the universe is constituted. It is one of the ultimate principles or substances of which phenomena are manifestations.

Matter is conceived by Jaina metaphysics as eternal, non-living, extensive, corporeal, concrete, active, subject to dissociation and combination, changeable, infinite, co-extensive with the Universe, possessed of the capacity to be received by Soul and to be of assistance to it. Its function is to form the basis of the body and the organs of speech, mind and respiration and also to contribute to pleasure, suffering, life and death of living beings.

The second chapter makes an analysis of the elements of Matter in the light of the conceptions of the elements of Matter as embodied in other Indian philosophies and the physical sciences by making comparative study of this problem. Jaina Pudgala represents the elements of Matter. Earth, water, shadow, the objects of the four senses—sense of hearing, sense of smell, sense of taste and sense of touch, except the sense of sight, karmic matter and atom (*paramāṇu*) constitute the material universe in the forms of molecules and discrete atoms. Earth, water, fire, air, and *ākāśa* (ether) have been accepted by other Indian systems of thought as the elements of Matter.

There appears to be a close relation of the structure of elements of Matter conceived by Jaina metaphysics with those of elements of Matter as embodied in other Indian philosophies.

The third chapter deals with the problem of *Indriyas* (sense-organs), *Karmapudgala* (Karmic matter) and *Leśyā* (condition of Soul). A comparative study of *Indriyas* by all Indian systems of thought reveals that the Jaina concept of *Indriyas* analysed from the physical and psychical aspects is more subtle and tho-

light-provoking, as they have been accepted as representing translucent matter.

Karmapudgala is conceived in Jaina metaphysics as material energy like Apūrva of the Mīmāṃsā and Avijñapti (unmanifested matter) of the Buddhist philosophy from the physical and psychical aspects (aspects of dravyakarma and bhāvakarma). There is no objection of any Indian system of thought in regard to Bhāvakarma (psychical karma=action). In the opinion of all the Indian philosophies rāga (attachment), dveṣa (aversion) and moha (delusion) are Bhāvakarma or the causes of Karma. That which is called Dravyakarma (physical karma=action) by Jaina metaphysics is called Karma by other Indian philosophies, Saṃskāra (force), Vāsanā (desire), Avijñapti (unmanifested matter), Māyā (Illusion) and Apūrva (Energy) are the different names of it. There is no particular dispute with regard to the entity—Karma, although there is a difference of opinions of the Indian philosophers on this point whether karma is material substance or quality or essential character or any other independent substance.

In Jaina philosophy Leśyā is conceived as the condition of Soul—physical (dravyaleśyā) as well as psychical (bhāvaleśyā). As to the nature of Dravya-leśyā there are three views viz. (1) Leśyādravya is composed of Karmavargaṇās (Karmavargaṇāniṣpanna), nevertheless, like the karmic body it is different from eight kinds of Karma—Jñānāvaraṇīya, etc. (2) Leśyādravya is the current (or continuity) of binding karma (karmanīṣyanda). Even there being karma in the fourteenth stage of spiritual development in the absence of its current, there is a possibility of the negation of Leśyā at the stage of spiritual development, and (3) Leśyādravya has been accepted as independent, belonging to yogavargaṇā (class of activity) (Yogapariṇāma).

The fourth chapter treats of the subject 'Atomism' by making a comparative study of all the Indian concepts of atom and those of western metaphysics and physics in relation to Jaina Atomism. The Indian thought on Atomism reflects a stage

of the emergence and development of Indian philosophy of a period in the field of metaphysical knowledge, when the speculative Indian mind with logical nicety went on to search out the basic principle of dissolution and creation of the material universe. In this speculation the Sāṃkhya-Yoga, Vaiśeṣika, Nyāya, Mīmāṃsaka, Bauddha, Vedānta and Jaina systems of thought have attacked the problem from their respective angles of vision and made attempts at the explanation and interpretation of the root cause of Atomism. The Cārvākas have admitted four or five elements of Matter as the basis of creation with a support for Atomism.

A study of Atomism of all the Indian systems of thought reveals that Jaina philosophy is the advocate of the atomic theory like the Nyāya-Vaiśeṣika. Nevertheless, the nature of atom conceived in this school of thought is not identical with that of atom of the Nyāya-Vaiśeṣika. But it compares well with the nature of Prakṛti of the Sāṃkhya, for atom of this philosophy is transformable like Prakṛti of the Sāṃkhya. On this ground atom of the Jainas changes into many forms like earth, water, fire, etc. just as Prakṛti is the material cause of many effects, such as, earth, water, fire, air, etc. It is not admitted by Jaina philosophy that the material atoms like earth-atoms, water-atoms, etc., are always basically of different classes. Atom of Jaina metaphysics is finer than atom of the Nyāya-Vaiśeṣika, but it is unmanifest like Prakṛti of the Sāṃkhya. Anantaparamāṇuvāda (concept of infinite ultimate atoms) of Jaina philosophy is not far from but nearer to the concept of infinite plurality of Prakṛtis of the early Sāṃkhya (with regard to the plurality of Puruṣa), i. e. "each being attached to a different Puruṣa (Self)." The phenomenalist atomic conception of the Buddhist philosophy is contrary to the substantive atomic theory of the Jaina, Nyāya-Vaiśeṣika and other Indian systems of thought. As regards the antiquity of Atomism, Jaina Atomism is earlier than Greek Atomism.

The fifth chapter deals with 'Properties of Matter'—general properties, motion and oscillation of Matter in the light of

the views of the physical science on them by making a comparative analysis of them with those of Matter as conceived by other Indian systems of thought. Properties are the characteristic qualities of Matter. Colour, taste, smell and touch are general qualities inherent in atom as well as molecule. Certain physical properties are stated to be possessed by molecules only, such as, grossness, shape, weight, divisibility, porosity, compressibility, density, elasticity, etc. Cohesiveness (attractive force) and dryness (repulsive force) impenetrability and extension are the common properties belonging to both atoms and molecules. Besides, Matter is possessed of the nature of mobility and immobility. Motion of a material body is determined by its successive positions in time. There takes place oscillation in atoms and molecules, and their motion occurs along with a straight line as well as a curved line. There take place uniform horizontal and vertical motions of free fall and translatory, curvilinear, rotatory and complex motions of Matter.

The sixth chapter makes a study of the effects and modifications of Matter in the light of the views of the physical sciences on them in comparison with those of other Indian philosophies regarding them. Matter exists in Nature occupying some volume in perceptible and imperceptible conditions in various forms of effects and modifications within the sensuous and supersensuous experiences. Its effects are stated to be earth, water, fire, air, vegetation and bodies of mobile beings, body, organs of speech, mind and respiration, while its modifications manifest themselves as sound, combination, fineness, grossness, shape, division, darkness, shadow, heat, light, etc. Modification belongs to both substance and its quality (*dravya* and *guṇa*). There are stated to be infinite modifications of Matter from the points of view of substance, state, immersion, duration and quality—colour, taste, smell and touch, etc.

A study of the modifications of Matter from these stand-points appear to be thought-provoking when compared to the

modes or relations of the material substance as dealt within the physical sciences.

In the seventh chapter Matter has been classified into one, two, three, four, six, twenty-three, five hundred thirty and infinite groups respectively from the points of view of (1) *dravya* (substance), *kṣetra* (locus), *kāla* (time) and *bhāva* (condition), (2) atomic and molecular forms of its existence, (3) apprehensibility and inapprehensibility, receivability, and non-receivability, etc., (4) transformation, (5) parts of molecules, (6) grossness and fineness, (7) *vargaṇā* (grouping), (8) prominence of particular quality and (9) *gati* (class), part of quality and mode.

The eighth chapter deals with the atomic structure of Matter and properties of atom, causative and ultimate discrete atom, the nature of atom in the light of the nature of Matter in comparison with the nature of atom of the *Sāṃkhya-Yoga*, *Nyāya-Vaiśeṣika*, Buddhist systems of thought, group of atoms according to their qualities, contact of atoms, vibration and motion of atom, speed of motion of atom, motion of atom by touching other forms of matter, resistance of Matter, non-resistance of atom and *Nyāya-Vaiśeṣika* view of motion of atom, etc. in continuation of the fourth chapter on Atomism. Atom is studied from the points of view of *dravya* (substance), *kṣetra* (locus or field), *kāla* (time) and *bhāva* (condition) with a comparative analysis of its concept of structure and properties as revealed in other Indian systems of thought and the physical sciences to some extent. An atom is partless, finest, discrete, beginningless particle of Matter corresponding to one space-point and one unit of time. It is endowed with the inherent qualities—colour, taste, smell and touch. It is infinite in number from the point of view of *dravya* (substance), a finest particle of Matter from that of *kṣetra* (locus), a momentary unit of time from that of *kāla* (time) and its qualities are ever changing in nature from that of *bhāva* (condition). Atom is the cause of the formation of molecule; it also comes into being out of the division of a molecule at last. Hence it is

the smallest and finest form of Matter and it is permanent. It is eternal from the point of view of dravya (substance) and non-eternal from that of bhāva (condition) of colour, smell, taste and touch.

Atoms are called kārāṇāṇu (causative atom) from the point of view of combination, and anantāṇu (ultimate discrete atom) from that of dissociation.

An atom is a substance and it is attributed by the name 'Dravyaparamāṇu. It is permanent and constant in number, for it does not give up its individuality and class, even undergoing transformation into a molecular form. It is non-living and it possesses existentiality which is inferable by the mark of its effect. It is devoid of mass, but it possesses the capacity to assume the form of mass by combining with other atoms.

An atom is acarama (not-last) from the aspect of dravya (substance), somehow carama (last) and somehow acarama (not-last) from those of locus, time and condition. An atom is partless with regard to dravya and also partless with regard to kṣetra (locus) invariably, it is partless in some respect and is having part in other respect with regard to kāla (time); it may be partless and it may have parts with regard to bhāva (condition) from the point of view of space-point.

As to property an atom is indivisible, incombustible, impenetrable or impassable, inapprehensible and non-receivable by soul. Here it appears that sūkṣmaparamāṇu is indivisible, etc. but Vyavahāra-paramāṇu which consists of infinite sūkṣma-paramāṇus seems to be divisible. An atom may be a single discrete unit of the material substance or a part of it. It is an ultimate cause and an eternal form of Matter having one colour, one taste, one smell and two touches. It is eternal from the point of view of dravya (substance) and non-eternal from that of bhāva (state or mode) of colour, taste, smell and touch. It is itself beginning, it is itself middle; it is itself end. It has got no dimension. Its motion is possible everywhere in the universe, that is way it is called Lokapramāṇa (extensive with the universe).

Atoms are infinite in number, but there is no fundamental difference among them like earth-atom, water-atom, etc. of other Indian systems of thought. An atom can assume any form according to the cause. There is no class-distinction among atoms of Jaina metaphysics. The capacities like colour, taste, smell and touch are equal in each and every atom and it can undergo transformation into any form according to the cause. Even though these capacities are equal in all of them, the varieties of their transformation take place due to the cause of the difference of materials. An aggregate (molecule) formed by a combination of atoms is not a new substance. It is only a particular form out of an aggregation of atoms. All atoms are permanent in their respective individual nature and they are changeable in nature as a result of their transformation in the forms of aggregate, quality and mode. All gross and fine material entities are explained on the basis of the capacity of transformation of infinite atoms and their combination and separation. Infinite atoms can exist in one point of space by their capacity of contraction (*saṃkoca*) or becoming finest. Being finest, they are infinite and smallest and all-pervading.

When an atom touches another one, the whole of it touches the whole of the latter; for there cannot be a conception of point in point. Atoms are always in a state of flux, because of their revolution, movement and combination with and dissociation from one another to transform themselves into molecules. A resistance to the motion of an atom is obtained by it (1) when it is resisted by another atom on its way of motion, (2) due to its property of dryness (repulsive force) and (3) at the last border of the universe because of the non-existence of *Dharmāstikāya* (Principle of motion) in the Non-Universe (*Aloka*).

The ninth chapter makes a treatment of the topic 'Transformation of Matter' by a comparative study of this problem with the views of other Indian systems of thought and the physical sciences on it. Matter undergoes transformation in respect of its qualities and modes. An atom having equal quality transforms another atom having equal but dissimilar quality because

of its combination with another atom or molecule. An atom having higher degrees of qualities transforms another atom having lower degrees of qualities. Some molecule is formed by the process of combination of atoms, some by the process of dissociation and some by both the processes.

The tenth chapter deals with the subject, 'Combination of Matter' according to some rules laid down in both the Śvetāmbara and Digambara works. A combination of atoms occurs as a result of the chemical behaviour of their properties of unequal degrees, i. e. cohesiveness (snigdhatva), dryness (rūkṣatva) and cohesiveness-cum-dryness (snigdhatva-rūkṣatva) which are inherent in atoms and molecules both having two to infinite units. A production of the material aggregates like dyad, triad, tetrad, etc. takes place due to a mutual contact and combination of discrete atoms, etc., endowed with the properties of cohesiveness (i. e. attractive force) and dryness (i. e. repulsive force). There take place two kinds of combination of cohesive and dry constituents of Matter, viz. similar (sadrśa) and dissimilar, (visadrśa), i. e. (1) a combination of a cohesive constituent with another cohesive one or that of a dry constituent with a dry one and a combination of a cohesive constituent with a dry one are called similar and dissimilar combinations respectively. The general rules of the combination of forms of Matter are as follows : (1) There does not occur a combination of the cohesive and dry constituents of Matter having a quantum of minimum properties. (2) There does not take place a combination of similar constituents of Matter, because of there being an equal quantum of properties. (3) Atoms having an equal degree of cohesiveness or dryness and being of the same kind, cannot combine with atoms of their own kinds. (4) There occurs a combination of similar or dissimilar constituents of Matter, having a difference in their degrees of cohesiveness or dryness by two units more.

The combination and dissociation of atoms and molecules always take place according to these rules. As a result of integration and disintegration of atoms there can take place infini-

tefold union of atoms with the material substances (pudgala parivarttas of paramāṇus).

In conclusion an estimation of the value of the Jaina concept of Matter has been made by making a comparative study of it with the concepts of Matter as embodied in other Indian systems of thought and the physical sciences with regard to its nature, elements, atomism, properties, effects and modifications, classification, atomic structure and atomic properties, motion, vibration and oscillation, its transformation and combination. The value of Jaina concept of Matter lies in the fact of its scientific approach to the problem of this permanent substance with its noumenal and phenomenal aspects from the points of view of dravya (substance), kṣetra (locus), kāla (time) and bhāva (condition). as it exists in space and continues in time with its static and dynamic forces in the cosmic universe.

The study of 'Concept of Matter in Jaina Philosophy'* was suggested to me by the late National Professor Śrī Satyendra Nath Bose, Ex-Vice-Chancellor of Visva-Bharati University, Santiniketan, in course of my discussion with him on the Jaina concept of Matter, while reading some aspects of it to him from my Ph. D. thesis 'Studies in the Bhagavati Sūtra' at his residence in Calcutta in 1961. Fortunately, I was awarded a Senior Research Fellowship by the University Grants Commission, Government of India, on the 6th November, 1963, to carry on my research studies in my long cherished subject 'Concept of Matter in Jaina Philosophy' at the Institute of Languages and Research, University of Jabalpur, under the supervision of my late revered teacher, Dr. Hiralal Jain, M. A., LL. B., D. Litt., Professor and Head of the Department of Sanskrit, Pali and Prakrit, Dean of Faculty of Arts, University of Jabalpur.

* The Title of this D. Litt. thesis 'Doctrine of Matter in Jainism' has been changed to "Concept of Matter in Jaina Philosophy" for publication as it is more appropriate in the light of its study.

In spite of some difficulties for not finding some of the necessary reference-books, journals, periodicals, etc. in the library of the Jabalpur University, as it was in the formative stage, I worked on my proposed subject 'Concept of Matter in Jaina Philosophy' under the mature guidance of my revered teacher, Dr. Hiralal Jain and completed my thesis for the D. Litt. Degree within proper time.

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CONTENTS

CHAPTER I

Pages.

Jaina Conception of Matter

1-46

Introduction 1, Concept of Matter (Pudgala) 25, Nature of Matter 33, Function of Matter 42, Ancient Greek Conception of Matter 44.

CHAPTER II

Elements of Matter

47-70

Elements of Matter in other Indian Systems of Thought 49, The Sāṃkhya-Yoga view on Elements of Matter 49, The Nyāya-Vaiśeṣika view on Elements of Matter 50, The Mīmāṃsā view on Elements of Matter 51, Criticism of the Nyāya-Vaiśeṣika view on Elements of Matter 52, The Buddhist view on Elements of Matter 54, Sixteen Sūkṣma Rūpas 57, Analysis of Elements of Matter as conceived in the Buddhist Philosophy 59, The Vedāntist view on Elements of Matter and The Conclusion with the modern view of the physical sciences on the subject 67.

CHAPTER III

Indriyas, Karma and Leśyā

71-106

Section I—Indriyas (Sense-organs) 71

Section II—Karma 79

Nature of Karmapudgala 80, The Nyāya-Vaiśeṣika view on Karma 85, The Sāṃkhya-Yoga view on Karma 87, The Buddhist view on the Nature of Karma 92, The Mīmāṃsaka view on the Nature of Karma 94, Kinds of Karma 97, Study of Karma from different points of view 99, Karmakāraṇa (Process of Karma) 100.

Section III—Leśyā (Condition of Soul) 101.

CHAPTER IV

Atomism

107-148

Introduction 107, Denial of Paramāṇuvāda (Atomism) by the Vijñānavādin Buddhists 109, Refutation of Paramāṇuvāda (Atomism) by the Vedāntist—Ācārya Śaṅkara and Others 113, Analysis of Atomism 124, Conception of Atom in Western Metaphysics and Physics 135, Analysis of Concept of Paramāṇu (Ultimate Atom) from the point of view of the definition of Pudgala (Matter) 137, Conclusion with a short note on the Brāhmanical and Buddhist Atomic theories 141.

CHAPTER V

Properties of Matter

149-183

Section I—General Properties of Matter 149, The Sāṃkhya view on the properties of Matter 156, The Nyāya-Vaiśeṣika view of the properties of Matter 157, Kinds of Four Specific qualities of Matter in the Nyāya-Vaiśeṣika Metaphysics 159, Properties of Matter in the Buddhist Philosophy 161, Kinds of Properties of Rūpa (Matter) 165, Tangible or Tactile Element (Spraṣṭavya) 167, Impenetrability 170.

Section II—Motion (Gati) of Matter (Pudgala) Oscillation or Vibration 171, Parispandana (Resolution of all physical action into motion) 172, Motion in the Nyāya-Vaiśeṣika philosophy 180, Oscillation in the Physical sciences 181,

CHAPTER VI

Effects and Modifications of Matter

184-222

Section I—Effect of Matter 184, Kāya (Embodiment) 185, Vanaspatikāya (Vegetation or Plant-Body) 187, Nigodaśarīra (Minutest body) 187, Trasakāya (body of mobile beings) 188, Śarīra (Gross Organic body), Vāk (Organs of speech),

Manas (Mind) and Prāṇāpāna (Respiration) 188, Vāk (Speech) 192, Manas (Mind) 194, Prāṇāpāna (Respiration) 200.

Section II—Manifestations and Modification of Matter 202, Śabda (sound) 202, Pitch, Intensity, Quality and Wave of Sound and its Propagation 206, Intensity of Emitted Speech (Bhāṣā) 207, Parāghāta Bhāṣā dravya 208, Bandha (binding) 212, Other Manifestations of Material Substance 214, Saukṣmya (fineness) 214, Sthaulya (grossness) 214, Saṁsthāna (shape) 214, Bheda (division) 214, Tamas (darkness) 215, Chāyā (shadow) 215, Ātapa (heat) 216, Udyota (cool light moonlight etc) 216, Modification of Matter 217, Ajīvaparyāya (modification of Non-living substance) 220.

CHAPTER VII

Classification of Matter

223-253

One class of Matter 224, Two classes of Matter 225, Skandha (Molecule or Aggregate) 229, Two Classes of Matter from the point of view of Apprehensibility 232, Three classes of Matter 235, Four Classes of matter 238, Six classes of Matter 239, Twenty three Vargaṇās (classes) of Matter 241, Five hundred and thirty classes of Matter 249, Infinite classes of Matter 252.

CHAPTER VIII

Atomic Structure of Matter and Properties of Atom 254-288

Section I—Atomic Structure of Matter 254, Causative Atom and Ultimate Discrete Atom (Kāraṇāṇu and Anantāṇu) 255, Nature of Atom in the light of the Nature of Matter 256, Nature of Paramāṇu (Atom) in the Sāṁkhya-Yoga Philosophy 258, The Nyāya-Vaiśeṣika view on Nature of Paramāṇu (Atom) 261, The Buddhist view on Nature of Paramāṇu (Atom) 265, A light on Carama (last) and

Acarama (Not last) Condition of Atom 268,
Apradeśa (partless) Condition of Paramāṇus
(Atoms) 269.

Section II—Properties of Atom (Paramāṇu) 271,
Group of Paramāṇu (Ultimate Atom) according of
their qualities 272, Contact of Atoms 273, Vibration
and Motion of Atom 276, Speed of Motion of
Paramāṇu 278, Sprṣtagati (Motion) of Atom by
touching other matters 279, Pratighāta of Pudgala
(Resistance of Matter) 282, Apratighāta (Non-
resistance) of Atom 284, The Nyāya-Vaiśeṣika view
on Motion of Paramāṇu (Atom) 284.

CHAPTER IX

Transformation of Matter (Pudgala Parīṇāma) 289-315

Kinds of Pudgala-Parīṇāma (transformation of
Matter) 294, The Sāṃkhya-Yoga view on Transfor-
mation of Matter 298, Transformation of Matter
in the Nyāya-Vaiśeṣika Philosophy 300, Pīlupāka
302, Piṭharapāka 304, The Vedāntic view on Trans-
formation of Matter 310.

CHAPTER X

Combination of Matter Particle 316-339

Combination and Separation of ultimate atoms of
molecules 324, Pudgalaparivarta (assembling toge-
ther of ultimate atoms with the material substances)
326, The Sāṃkhya view on the Combination of
Matter 329, The Nyāya-Vaiśeṣika view on the Com-
bination of Matter 332, The Buddhist view on the
Combination of Matter 336.

CONCLUSION

Value of the Jaina Conception of Matter 340-345

BIBLIOGRAPHY 346-355

ABBREVIATION

Abh		Abhidharmamṅgaśāstra
Abh. D	=	Abhidharmadīpa
Abh. K.	=	Abhidharmakośa
Asl.	=	Atthasālini
Bhs.	=	Bhagavati Sūtra (Vyākhyā Prajñapti)
BR.	=	Bhāṣārahasya
BS.	=	Brahmasūtra
Bhā	=	Bhāṣya
Comm.	=	Commentary
Cph.	=	Compendium of Philosophy of Mr. Aung.
Dhs.	=	Dhammasaṅgani
DS.	=	Dravyasaṃgraha
ERE	=	Encyclopaedia of Religion and Ethics
GS.	=	Gommatasāra
Gā.	=	Gāthā
H.	=	Hindi
H. I. Ph	=	History of Indian Philosophy
Jīva	=	Jīvakāṇḍa
KR.	=	Kaṇādarahasya
KV.	=	Kiraṇāvalī
KV. Bha.	=	Kiraṇāvalī Bhāskara
Kā	=	Kārikā
LP.	=	Lokaparakāśa
Loka	=	Lokaparakāśa
Majjh	=	Majjhimanikāya
Mbh.	=	Mahābhārata
MK.	=	Madhyamakakārikā

xxx The Concept of Matter in Jaina Philosophy

NBhā.	=	Nyāyabhāṣya
NK.	=	Nyāyakandaḥ
Nku.	=	Nyāyakusumāñjali
N Kub.	=	Nyāyakusumāñjalibodhini
NLV.	=	Nyāyalilāvati
NLVK.	=	Nyāyalilāvatiḥkaṇṭhābharaṇa
NM.	=	Nyāyamañjarī
NP.	=	Nayanaprasādini
NS.	=	Nyāyasūtra
NV.	=	Nyāyavārtika
NVTT.	=	Nyāyavārtika Tātparyatīkā
Paṇṇa.	=	Paṇṇavaṇā
PBhā.	=	Pravacanabhāṣya
PPBhā.	=	Prasastapādabhāṣya
PPV.	=	Pravacanapradīpikāvṛtti
PR.	=	Pravacanasāra
PRTV.	=	Pravacanasāra pradīpikā Tīkāvṛtti
PS.	=	Pañcāstikāyasāra
PSAH.	=	Positive Sciences of the Ancient Hindus
PTN.	=	Padārthatattvanirūpaṇa
PV.	=	Paṇṇavaṇā
RV.	=	Rājavārtika
Ṣaṭ.	=	Ṣaṭkhaṇḍāgama
SS.	=	Sarvārthasiddhi
ŚBhā	=	Śāṅkarabhāṣya
Śl.	=	Śloka
Sthā.	=	Sthānāṅga
Sū.	=	Sūtra
TK.	=	Tattvakaumudī

TP.	=	Tattvasaṁgrahapañjikā
TRV.	=	Tatvārtha Rājavārtika
TS.	=	Tattvārthādhigamasūtra
TSBhā.	=	Tattvārthādhigamasūtra Bhāṣya
Utt.	=	Uttarādhyaṇasūtra
Uttarā.	=	Uttarādhyaṇasūtra
Utt. Tī	=	Uttarādhyaṇasūtra Tīkā
VM.	—	Visuddhimagga
VS.	=	Vaiśeṣikasūtra
VSU.	=	Vaiśeṣikasūtra Upaskāra
VV.	—	Vyomavatī Vṛtti
VBhā.	—	Viśeṣāvaśyaka Bhāṣya
V. Sū.	—	Vyāsabhāṣya
Y. Sū.	—	Yogasūtra
Yaśo.	—	Yaśomitra
Yoga.	—	Yogasūtra



SYSTEM OF TRANSLITERATION

Vowels

अ	आ	इ	ई	उ	ऊ	ऋ	ए	ऐ	ओ	औ
a	ā,	i	ī,	u,	ū,	r,	e,	ai,	o	au

Consonants

क	ख	ग	घ	ङ	च	छ	ज	झ	ञ
k,	kh,	g,	gh,	ṅ,	c,	ch,	j,	jh	ñ
ट	ठ	ड	ढ	ण	त	थ	द	ध	न
ṭ,	ṭh	ḍ,	ḍh,	ṇ,	t	th,	d,	dh,	n,
प	फ	ब	भ	म	य	र	ल	व	श
p,	ph,	b,	bh,	m,	y,	r,	l,	v,	ś,
ष	स	ह		:					
ṣ,	s,	h,	m	ḥ					



CHAPTER I

JAINA CONCEPTION OF MATTER

Introduction

A study of the Jaina Āgamas reveals that Metaphysics is something which is correlated with physics, but the metaphysical inquiry goes beyond the scope of physics. According to the Jaina Āgamas, the Universe (Loka) is a system of reals, all inter-related with one another with regard to dravya (substance), kṣetra (locus or field), kāla (time) and bhāva (condition or state or mode), having a fundamental unity comprising the plurality of inter-dependent and inter-connected substances. As for example, there are stated to be four aspects of the Universe from the points of view of dravya, kṣetra, kāla and bhāva¹ respectively, i. e. a system of reals is studied with regard to substance, locus or field, time and condition respectively.

The Universe is finite with regard to substance, as it is one in number; it is also finite with regard to locus or field, having the dimension of length and breadth of countless crores of yojanas; it is infinite, permanent, continuous, undecaying, constant, eternal and endless with that to time, for it is Traikālika (i. e. was, is and will be in the past, present and future respectively); there was not, is not and will not be such a time when the existence of the Universe was not, is not and will not be continuous respectively; it is also infinite with regard to condition because the modes of the substances of the Universe, such as, modes of colour, smell, taste and touch, figure, heaviness and lightness, and neither heaviness nor lightness, etc., of pudgala (matter) are infinite.² So the Universe

1. Cauvvihe loe paṇṇatte, taṃjahā davvao, khettao, kālao, bhāvao—Bhagavatī (Vyākhyāprajñapti) 2. 1. 90.
2. Davvao paṇṇ ege loe sa-aṃte . . . bhāvao paṇṇ loe aṇaṃtā vaṇṇapajjavā . . . paṭṭhi puna se aṃte.—Ibid.

is eternal, for there is no change in its eternal form from the point of view of its existence and it is regarded as non-eternal in its non-eternal forms from the point of view of modes—decrease and increase, for, if there be a change in one part of the Universe, there occurs a change in the whole of it.

According to Jaina philosophy, Dravya (substance) endowed with guṇa and paryāya (quality and mode or modification) is conceived as Reality. Sat (existence) is the characteristic of Dravya and origination, decay and permanence characterize Reality i.e. Sat-Dravya¹. Dravya² is the crux of Jaina Metaphysics and Physics in particular and a central theme of some Indian

Antavaṃ nī-īe loe dhīro ti pāsai—Sūtrakṛtāṅga, 1.1.4 (6); Majjhimanikāya II, Cūlamālunkhiyaputta Sutta, 13 for the eternality and non-eternality of the Universe. In this connection see also Bhagavati, 9. 33. 387 ff.; 2. 1. 90 ff. for eternality and non-eternality, finiteness and infiniteness of the Universe.

1. Utpādavyayadhrauvyayuktaṃ sat—Tattvārthādhigama Sūtra, V. 29.; śad-dravyalakṣaṇaṃ—Sarvārthasiddhi, V. 29.
2. Nāmasthāpanādravyabhāvatastannyāsaḥ—TS., 1.5.; Davvao ...bhāvao—Bhagavati, 2. 1. 90, Dravyārthikanaya (substantial) and paryāyārthikanaya (mode) point of view; TS. Bhāṣya, V. 31, pp. 399-401; Dravyācāra (external conduct) and Bhāvācāra (internal conduct),; Pañcāśaka, 6; Dravya-karma and Bhāvākarma (Physical and psychic actions),; Ṣaṭkhaṇḍāgama, Vol. 13., p. 43; Bhagavati, 25. 4. 733; TS., V. 37, 39; Ṣaṭkhaṇḍāgama, Vol. 3, p. 2; Ibid., Vol. 15, p. 33. Uttarādhyayana, 28. 6 ff. Tattvārtha Rājavārtika, V. 29, 30; Tattvārtha Śloka-vārtika, V. 29, 30; TS. V. 37; Sarvārthasiddhi, V. 38; T. Rājavārtika, V. 38; T. Śloka-vārtika, V. 38; Ṣaṭkhaṇḍāgama, Vol. III, p. 2; Viśeṣaśāśyaka-bhāṣya, gāthā, 28; Laghūyastrayaṃ, 1. 2. 7, p. 3; Pramāṇamīmāṃsā, 30, p. 24; Pravacanasāra, Vol. II, p. 123, etc.

systems¹ of thought, in general, while substance (i. e. Dravya) is the pivotal point of philosophy of Spinoza² and Prof. Bertrand Russel.³

Prof. Bertrand Russel defines a substances as “that which can only enter into a proposition as subject, never as predicate or relation. Metaphysically, substances have generally been held to be indestructible.”⁴

The Vaiśeṣika⁵ influence is evidently felt on the Jaina conception of Dravya (substance) endowed with guṇa and paryāya (mode),⁶ for like the Vaiśeṣika philosophy the Jaina post-Āgamic work Tattvārthādhigama Sūtra of Umāsvāti defines Dravya as possessing guṇa and paryāya⁷ instead of Karma (action) of the former. Karma of the Vaiśeṣika is equivalent to paryāya (mode) of Jaina philosophy. Besides, Sattā⁸ (existence or being) is one and the same in both the systems of thought, while it is categorized into six entities in

1. Aṣṭādhyāyī of Pāṇini, Vol. I. 4. 3. 161; Vol. II, 6. 1.79; Vaiśeṣika Sūtra, 1.1.5; 1.1. 15; Mahābhāṣya of Patañjali, 4. 1. 3; 5. 1. 119; Yogabhāṣya, 3.13.; Śloka-vārtika, Vanavāda, verses 21-22.; Abhidharmakośa, IX; Ibid., (comm), Yaśomitra; Abh. K. I. 3; Abhidharmadīpa, p. 90; The Central Conception of Buddhism, p. 22, etc.
2. Spinoza, pp. 31-9, 62-5.
3. Analysis of Matter, p. 236.
4. Ibid, p. 238.
5. Kriyāguṇavat samavāyikāraṇamiti dravyalakṣaṇam—V S., I. 1. 14
6. Guṇaparyāyavad-dravyam—TS., V. 37.
7. Ibid.
8. Sat iti yato dravyaguṇakarmasu sa sattā — VS., 1.2.7; Sattayā sāmānyena sambandhaḥ samavāyarūpo dravyaguṇakarmāṇām sādharmyam — Nyāyakandali, p. 17; Sattā savvapayatthā, savissarūvā aṇamtapajjāyā Bhaṅguppadadhuvattā sapaḍivakkhā havadi ekkā — Pañcāstikāyasāra, 8.

both of them, i. e. *Ṣaḍ-dravyas*¹ of the Jainas and *Ṣaṭ-padārthas*² of the Vaiśeṣikas.

According to the Vaiśeṣika, *Dravya*, *guṇa*³ and *karma* are different,⁴ whereas *Dravya*, *guṇa* and *paryāya* of Jaina Metaphysics are of one class.⁵ *Guṇa* inheres in *Dravya*⁶ and is inseparable from it. It is the capacity, the change of this capacity is *paryāya*.⁷ *Guṇa* is potentiality, while *paryāya* is actuality on the screen of time. They continue with *Dravya* like earthness or clayiness and pitcher.⁸ *Guṇas*⁹ separable and inseparable from *Dravya* are *paryāya* and *guṇa* proper respectively, for *paryāya* keeps changing, but *guṇa* is permanently associated with *Dravya*;¹⁰ there is no existence of *Dravya* on the destruction or separation of *guṇa*.¹¹

According to the Sāṃkhya philosophy, the three *guṇas* (qualities) *Sattva* (essence), *Rajas* (energy) and *Tamas* (mass or inertia) are the components of *Prakṛti*¹² which is the stuff.

1. *Bhagavatī* 25.4.733-4; 11.14.4.24; 13.4.4. 82. 3; *Anuyoga-dvāra*, 324; *Gommatasāra* (Jīva), 560.
2. *Dravyaguṇakarmasāmānyaviśeṣasamavāyānām padārthānām—Vaiśeṣika Sūtra*, 1.1.4.
3. *Dravyāṇi dravyāntaramārabhante guṇāśca guṇāntaram—VS.*, 1.1. 8-9.
4. *Dravyaguṇakarmasāmānyaviśeṣasamavāyābhāvāḥ saptapadārthāḥ—Tarkasaṃgraha*, p. 2;
Artha iti dravyaguṇakarmasu—VS., 8.2.3.
5. *Guṇaparyāyavaddravyam—TS.*, V. 37.
6. *Dravyaśrayā nirguṇā guṇāḥ—Ibid*, V. 40.
7. *Bhāvāntaram sañjñāntaram ca paryāyaḥ—TS. Bhāṣya*, p. 427
8. *Ibid*, pp. 426-29.
9. *Sarvārthasiddhi*, p. 510.
10. *Ibid*, p. 510.
11. *Sakalaguṇoparamae punarna taddravyam—Paramāṇukhaṇḍa Ṣaṭtrimśikā*.
12. *Triguṇamaviveki Viśayaḥ*, etc.—*Sāṃkhya Kārikā*, 11.

The Buddhists accept *guṇas* (qualities) instead of the stuff as *dharma*s¹ (elements); the Jainas admit both the stuff and quality. But Ācārya Śaṅkara, the Vedāntin, conceives only the Brahman² as the stuff according to the doctrine of self-alienation (*vivartavāda*). The Buddhists maintain that there is no substratum of *guṇa* and they admit *dharma*s³ or *guṇas* as the ultimate elements, while the Sāṃkhya accepts *Prakṛti* as *Dravya* composed of the afforesaid three *guṇas*. In fact, *guṇas* or *dharma*s of the Buddhists correspond to the Sāṃkhya *guṇas*—*Sattva*, *Rajas* and *Tamas*.⁴ It can be said that according to Buddhism, *Dravya* is nothing but *guṇasamudāya* (collection of qualities)⁵ or *guṇasandrāva*⁶ (series of qualities), i. e. *sahabhu*⁷ or *samabhu* of *guṇas* (co-existence of qualities); the existence of qualities in succession (*Kramabhu*)⁸ is *paryāya* (mode).

In the Sāṃkhya view *Prakṛti* and *Puruṣa* are beginningless while *samabhu*—*Sattva* (essence), *Rajas* (energy) and *Tamas* (mass or inertia), *Buddhi* (intellect), *Ahaṃkāra* (ego) and *Manas* (mind) are the *paryāyas* of *Prakṛti* in some respect.

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1. The Central Conception of Buddhism, p. 9.
Svalakṣaṇadhāraṇād-dharmaḥ — Abhidharma Kośa, I. 3.
 2. Atha Brahmajijñāseti — Brahmasūtra I. 1.
Ekamevādvittyaṁ — Chāndogya Upaniṣad, VI. 2. 1.
 3. Svalakṣaṇadhāraṇād-dharmaḥ — Abh. K., I. 3.
 4. The Central Conception of Buddhism, p. 19.
 5. Mahābhāṣya, 4.1.3.
 6. Guṇasandrāvo dravyamiti — Ibid., 5. 119.
 7. Guṇaḥ sahabhāvī, dharmo yathātmani vijñānavyaktiśakti-yādīḥ — Pramāṇanayatattvālokālankāra, 7.
 8. Paryāyastu kramabhāvī yathā tatraiva sukhaduḥkḥādīḥ — Ibid., 8; Guṇa = śakti = sahabhu—natural. Sahabhuśakti is Kāraṇa (cause), while paryāya kramabhuśakti is Kārya (effect).

Jīva and Cetanā¹ (soul and consciousness) are co-existent (Sahabhu), while knowledge is a paryāya of Cetanā² (consciousness) but there is a continuity between them. It is to be observed from the analysis of Saccidānanda Brahman that Sat is Reality, i. e. Dravya of the Jainas, cit and ānanda (consciousness and bliss) are guṇas (qualities). Sat and cit are primary and ānanda is secondary, i. e. general and particular. From the empirical point of view, guṇas, because of being separable and inseparable, correspond thus to paryāya (mode) and guṇa (quality) proper respectively.

The Nyāya-Vaiśeṣika³ admits distinct and separate relation between Dravya and guṇa, while the Sāṃkhya⁴, Jaina⁵ and Mīmāṃsaka⁶ systems of thought accept Kathanācidbhedā (somehow distinction or difference) between Dravya and guṇa. The Vedānta Philosophy⁷ maintains non-difference between them. The Jainas call the manifestation of Dravya and guṇa, as paryāya (mode). Śakti (capacity) is intangible, it becomes manifest. Sahabhuśakti (co-existing capacity) is guṇa.

1. The Sāṃkhya guṇas-Sattva (essence), Rajas (energy) and Tamas (inertia) are Anādi (beginningless) and Ananta (infinite). The Jaina guṇas as Śaktis. (capacities) are kāraṇas (causes), while their paryāyas (modes) are kāryas (effects), e. g. Cetanā (consciousness) is guṇa (quality), while Jñāna (knowledge), Darśana (self-awareness), etc. are its paryāyas (modes). Varṇa (colour), etc. as guṇas are causes, while Varṇaparyāyas (modes of colour), etc. are effects. The Jainas used term 'guṇa' like the Sāṃkhya, while the Mīmāṃsaka used the word, Śakti' for guṇa.
2. Ibid.
3. Dravyāṇi dravyāntaramārabhante guṇāśca guṇāntaram —
VS., I. 1. 10
4. Trigūṇamaviveki viśayaḥ, etc. Sāṃkhya kārikā I
5. Kathanācid-bhedābhedasvarūpaṁ guṇaparyāyavat —
TS. Bhāṣya Tīkā, pp. 428-9.
6. Śloka-vārtika, Vanavāda, vv. 22-23.
7. Ekamevādviṭīyaṁ," Chāndogya Upaniṣad, VI. 2.1.

while Dravya is the transcendental Reality (atīndriya). In the Sāṃkhya philosophy Sattva, Rajas and Tamas, the three components of Prakṛti are unmanifest, while the entities like earth, etc. are manifest. Mūladravya (basic substance) is unmanifest and intangible, e. g. paramāṇu (ultimate atom)¹, while Dravyaparyāya (mode of substance) is manifest. Even among Dravyaparyāyas some are atīndriya (intangible to senses) and some are tangible, e. g. dvyaṇuka (dyad)², taijasa (luminous) and Kārmaṇa (karmic) bodies³ are atīndriya, while other skandhas⁴ (molecules) and effects of Matter are tangible to the senses (indriyagrāhya). So Dravya (substance) of the Jains is unmanifest and beginningless, the Sāṃkhya Prakṛti also is unmanifest and beginningless. Similarly the Santānas of the Buddhists and the Brahman and Ātman of the Vedānta philosophy are beginningless. An entity becomes manifest only at the present moment with its perception.

The relation of Dravya and guṇa of Jaina Philosophy is further explained in this way that guṇas can never exist independently of Dravya⁵ of which they are the attributes⁶ and one guṇa cannot be the substratum of another guṇa. The Vaiśeṣika school also maintains that guṇa and karma are dravyāśrita⁷ (inherent in substance). That which belongs is dharma (essential character) and that which supports is dharmin (substratum). In other words, that which is inherent in others is dharma (essential character or attribute). The Vaiśeṣika falls behind Jaina metaphysics in this respect of

1. Bhagavati sūtra. 20. 5. 670; TS. Bhāṣya Ṭīkā, p. 366.

2. Gauḍapāda on Sāṃkhyakārikā, 12.

3. TS., II. 38, 39 and its bhāṣya.

4. TS., Bhāṣya. Ṭīkā, p. 366.

5. Sakalaguṇoparame punarṇa dravyam — Paramāṇu khaṇḍa Śatṭrimśikā, p. 3.

6. Dravyāśrayā nirguṇā guṇāḥ, TS., V. 40.

7. VS., I. 1. 16 (Dravyāśrayaguṇavān...guṇalakṣaṇam); Praśastapāda's Bhāṣya, p. 38; "Kriyāguṇavat samavāyī-kāraṇamiti dravyalakṣaṇam, VS., I. 1. 15.

the relation between Dravya and guṇa, for Dravya is defined as “Guṇaparyāyavad-dravyam¹” in the latter. In the Sāṃkhya philosophy guṇa is a component of Prakṛti. Dravyāśrita guṇa is dharma (character); there is mention of fifty bhāvas (dispositions²) in the Sāṃkhya Philosophy. Similarly the relation of the Buddhist citta (mind) and its dharma—caitasika (mental) is that citta is one, while caitasikas are many³. It appears from this evidence that the Sāṃkhya influence is evidently felt on Buddhism in this respect. Dharmin (substratum) is manifested by traikālika paryāyas (modes of three points of time—past, present and future), otherwise it becomes inapprehensible to the senses, i. e. the form in which it is apprehensible to the senses at the present time. The gist of the Jaina conception of Reality is that Dravya is endowed with guṇa and paryāya. The inherent qualities in a substance and their traikālika modes are infinite⁴ in number. A substance and its inherent qualities are permanent owing to the cause of its non-origination and non-destruction,⁵ while modes because of their origination and destruction at every moment are invariably non-permanent.⁶ But they are also beginningless and permanent, from the point of view of the series of infinite modes (aṇantā pajjavā),⁷ e. g. the material substance is permanent and its inherent qualities, such as, colour, etc. are also permanent. But the modes of colours, such as, blue, yellow, etc. born of the quality of colour are individually non-permanent because of being subject to origination and destruction and the series of modes of colour, being traikālika, are

1. TS., V. 37

2. Tattvasamāśasūtra, pp. 282-8.

3. The Central Conception of Buddhism, pp. 85 ff.

4. Bha., 2. 1. 91.

5. Uppattiva vināso davvassa ya natthi atthi sabbhāvo — Pañcāstikāyasāra, II.

6. Vyayam uppadam dhuvattam karamti tasseva pajjayā — Ibid.

7. Bhs., 2.1. 90; Tattvārtha Sūtra, V. 37.

permanent and eternal.¹ The series of traikālika modes taking place due to one causative capacity inherent in a substance are of the same class. The series of infinite modes caused by infinite capacities in a substance are moving (i. e. continuing) together. The modes of different class caused by various capacities can be found in one substance at a time, but the modes of the same class caused by one capacity at different times cannot be found in one substance at a time.² These take place in the material substance³ into various infinite modes like the modes of colour, such as, blue, yellow, etc.

Matter undergoes transformation by its capacity of colour into various forms of colour, such as, black, etc. The capacity of colour cannot be separated from the material substance and other capacities also which are inherent in it. In matter the series of various modes of colours, such as, blue, etc. are the effects of one causative capacity of colour. There are always taking place in Matter the series of colour, smell, taste, touch, etc. For this reason infinite capacities are cognized by admitting each individual causative capacity of individual series like that of the capacity of colour, that of smell, that of taste, that of touch, etc.

Various modes of capacities, such as, colour, smell, etc. occur in Matter at a time, but different modes, such as, blue, yellow, etc. of one capacity of colour do not take place simultaneously. As material substances are permanent, so their inherent qualities also are permanent, but the modes of the capacity of colour, etc. are not permanent. They, being always subject to origination and destruction, are individually non-permanent and the series of modes of colour in Matter are permanent because of being traikālika.

The undivided whole of infinite qualities only is Dravya (substance). That is to say, the collective whole or aggregate of each individual causative capacity (Kāraṇabhūtaśakti)

1. Tattvārtha Sūtra, V. 37, pp. 229-30.

2. Ibid., p. 206.

3. Bhs., 2. 1. 90.

of each individual mode and of such infinite capacities or qualities is substance from the point of view of difference among them. But Dravya (substance) is called *guṇaparyāyāt-maka* (endowed with quality and mode) from the point of view of non-difference among them because of modes being like their own causative qualities (*Kāraṇabhūtaguṇas*) and qualities being like Dravya (substance). That is to say, Dravya, *guṇa* and *paryāya* are different from one another from the subjective point of view in thought, but they are non-different from one another from the objective point of view.¹

In a substance all qualities are not identical; some common qualities are found in all substances, e. g. *Astitva* (existence), *Pradeśatva* (capacity of having some form), *Jñeyatva* (knowability), etc. and some are uncommon (i. e. specific) qualities which can be found in each individual substance, e. g. sentiency (*Cetanā*), consciousness (*Upayoga*), etc. in soul and colour (*Rūpa*), etc. in Matter. Each substance is distinct and separate from other substances because of its uncommon quality and modes.²

The Jaina conception of the series of material substances, their qualities and modes is supported by the physical sciences to some extent. It is explained by Prof. Bertrand Russell that "The substitution of space, time for space and time has made it much more natural than formerly to conceive a piece of matter as a group of events. Physics starts, now-a-days, from a four dimensional manifold of events, not, as formerly, from a temporal series of three dimensional manifolds connected with each other by the conception of matter in motion. Instead of a permanent piece of matter, we have now the conception of a 'world line', which is a series of events connected with each other in a certain way. The parts of one light-ray are

1. *Tattvārtha Sūtra*, V. 37.

2. *Ibid.*, p. 208; See also *Dravya-Guṇa-Paryāyano Rāsa* and *Āgamasāra* for the inter-relation of Dravya (substance), *guṇa* (quality) and *paryāya* (mode).

connected with each other in a manner which enables us to consider them as forming together one light-ray but we do not conceive a light-ray as a substance moving with the velocity of light. Just the same kind of connection may be held to constitute the unity of an electron. We have a series of events connected together by the causal laws; these may be taken to be electron, since anything further is rash influence which is theoretically useless".¹

As explained, the universal principle of Reality is Dravya (substance), while its particular characteristics are Jivadravya (sentient principle of living substance) and Ajivadravya (non-sentient principle or non-living substance),² Jivadravya is non-corporeal, tasteless, smell-less and indescribable; it is endowed with sentiency, it is soundless, non-apprehensible by a mark; and it is of indefinite shape (anirdiṣṭasaṁsthāna).³

The common characteristics of Jivadravya are that it is devoid of five colours, five tastes, two smells and eight touches, i. e. non-material; it is subtle and non-corporeal, neither heavy nor light; it is endowed with countless points and indefinite figure;⁴ while its uncommon characteristics are that it is the enjoyer and self-manifesting and manifester of others.⁵ Ajivadravya⁶ is explained by making division of it into five cate-

1. Analysis of Matter, pp. 244-45.

2. Duvihā davvā pi taṁ jīvadavvā ya ajivadavvā ya — Bhs., 25. 2. 720; Avisesie davve visesie jīvadavve ajīvadavve ya — Anuyogadvāra sūtra, 123; Jivābhigama Sūtra, 1st chapter; Uttarādhyayana Sūtra, 36. 2; Śaṭkhaṇḍāgama, Vol. III, p. 2; TS., V. 1-3; Pravacanasāra, 35, p. 178; Dravyasaṁgraha, 23; Gommatasāra, 562,

3. Śaṭkhaṇḍāgama, Vol. III. p. 2.

4. Ibid., p. 1.

5. Uddhagaḷ bhottā saparapagāsao ttijīvassa asāhāraṇalakhaṇaṁ, Ibid.

6. Bhs., 25. 2. 720; 7. 10. 307; Sthānāṅga 4.1.251; Ajivakāyā dharmādharmākāśa-pudgalāḥ — TS., V. 1; —Dravyāni Ibid., V. 2.

gories, viz. Dharmāstikāya (principle of motion), Adharmāstikāya (principle of rest), Ākāśastikāya (space), Pudgalāstikāya (matter) and Addhāsamaya or Kāla¹ (time). These Ajīvadravayas are classified into two groups, viz., Rūpajīvadravayas (corporeal non-living substances which are both tangible and intangible to the senses) and Arūpajīvadravayas (non-corporeal, non-living substances which are intangible to the senses).² Pudgala is a corporeal non-living substance.³ So non-corporeal, non-living substance, consists of Dharmāstikāya, Adharmāstikāya, Ākāśastikāya and Addhāsamaya or Kāla.⁴

A study of other Indian systems of thought except the extreme views of monistic materialism of the Cārvākas and monistic spiritualism of the Vedānta reveals also that there are two aspects of Reality (Satvastu), viz. Cetanatattva (sentient principle) and Acetanatattva (non-sentient principle). In the Sāṃkhya-Yoga Puruṣa and Prakṛti are Cetanatattva and Acetanatattva respectively as the two aspects of Reality.⁵ According to the Nyāya-Vaiśeṣika system of thought, only Ātmā (soul-substance) among the nine categories of Dravya (substance) is Cetanatattva like Jīva (soul) of Jaina philosophy. The difference between them is this that the reflection (Chāyā) of Jaḍatattva (non-sentient principle) does not fall (i. e. affect) on the soul-substance of the Nyāya-Vaiśeṣika school, whereas it falls on the soul-substance of Jaina metaphysics. Other eight substances, viz. earth, water, fire, air, ether (ākāśa), direction (dik), time and mind are the non-sentient

1. Bhs., 25. 2. 720; Dravyasaṃgraha, 15, p. 44; Gommatasāra, 563, p. 209 (Jīvakāṇḍa)
2. Bhs., 25. 2. 720; Jīvābhigama, 3, p. 105; Paṇṇavanā, 2, p. 265; Anuyogadvāra, 142; Śaṭkhaṇḍāgama, Vol. III. p. 2
3. Bhs. 7.10 305; Sthānāṅga, 5.4.3 Rupīṇaḥ pudgalāḥ TS.. V. 4.
4. Ibid., See also Gommatasāra, 563 (Jīvakāṇḍa), p. 209.
5. Sāṃkhyadarśana, 15, 18; Sāṃkhya kārikā, Īśvarakṛṣṇa III.

principle of the Nyāya-Vaiśeṣika philosophy.¹ The Mīmāṃsā² admits the existence of Cetanatattva (the self) and Acetanatattva (non-sentient principle) like the Nyāya-Vaiśeṣika system of thought.

According to the Buddhist philosophy, Nāma or Citta (mind) and Rūpa (matter) represent Cetanatattva and Acetanatattva³ respectively. Nāma or Citta includes the four mental elements, viz. Vedanā (feelings), saṃjñā (ideas), saṃskāras (volition and other faculties) and vijñāna (pure sensation or general consciousness), while Rūpa represents the elements of Matter, the physical elements of a personality (Pudgala) including its outer world—the external objects.

The Vedānta system of thought⁴ accepts the Absolute Brahman and Jagat (the Universe) as Cetanatattva and Acetanatattva respectively, although it regards Jagat to be the effect of the Brahman (Universal self), produced by its Māyāśakti (power of illusion) which is also called Prakṛti⁵, as Nāma (name) and Rūpa (form).

1. Pṛthivyāpastejo vāyurākāśaṃ kālo digātmā mana iti dravyāṇi — VS., I. 1. 5; Tatra dravyāṇi pṛthivyāpastejo ... navaiveti.— Praśastapādabhāṣya, p. 3.

2. Prakaraṇa Pañcikā, p. 52, etc. and Prabhākara Mīmāṃsā, p. 35, etc., vide History of Indian Philosophy, Vol I, p. 378.

3. The Central Conception of Buddhism, pp. 5-6; The Basic Conception of Buddhism, pp. 87-88, F. Note No. 41, 42.

4. Atha Brahmajijñāseti — Brahmasūtra, 1.1. 10; Janmādyasya yataḥ — Ibid., I. 1. 2.

5. Chandāṃsi yajñāḥ kṛtave vratāni
bhūtaṃ bhavyaṃ yacca vedā vadanti
Asmānmāyī sṛjate viśvameva—
tasmiṃścānyo māyayā saṃniruddhaḥ.

—Śvetāśvatara Upaniṣad, 4. 9;

Māyāṃ tu prakṛtiṃ vidyānmāyinaṃ tu maheśvaraṃ
Tasyāvayavabhūtaistu vyāptaṃ sarvamidaṃ jagat.

—Ibid., 4.10.)

The Rāmānuja School of Vedānta also advocates the doctrine of Cit and Acit¹ as the central theme of studies, i. e. the sentient and non-sentient principles. According to the Cārvākas, "everything else including consciousness and other psychic phenomena, indeed, the whole paraphernalia of the so-called spiritual life is a function of matter."²

In a nutshell it can be said that there are two traditions of these principles—Ātmā tradition and Ātom-tradition which manifest themselves as Cetanatattva and Acetanatattva in infinite forms and manners with their respective characteristics in the Universe. In Western metaphysics also this 'Dualism of Matter and Spirit' is explained in this way that "Each atom of the nebula...must have had an aboriginal atom of consciousness linked with it; and just as the material atoms have formed bodies and brains by massing themselves together, so the mental atoms, by an analogous process of aggregation, have fused into those larger consciousness."³

The emergence of the thought on Cetanatattva (sentient principle) can be traced back to Bhūtacaitanyavāda (doctrine of consciousness born out of material elements), Svatantra-jīvacaitanyavāda (doctrine of independent soul), Svatantra and Parāśrita Jīvacaitanyavāda (doctrine of independent and dependent soul).⁴

1. Śrībhāṣya, Rāmānuja, 1. 1. 43.
2. The Conception of Matter According to Nyāya-Vaiśeṣika, p. x.
3. The Principle of Psychology, p. 147.
4. Bhāratīyatattvavidyā, p. 75; Kālaḥ svabhāvo niyatiryaḍcchā bhūtāni yoniḥ puruṣa iti cintyaṁ, Śvetāśvatara Upaniṣad—1. 2; Idam mahadbhūta-manantamapāram vijñānaghana evaitebhyo bhūtebhyaḥ samutthāya tānyevānuvinaśyati na pretya samjñāsti — Brhadāraṇyaka Upaniṣad, 2.4.12; — Vīro davvaṁ khettaṁ mahesena vanaṁ pamāṇo kāla ya Bhāvo u bhāvapurīso samāsayo niggamaṁgāim; Viśeṣāvaśyakabhāṣya, gāthā, 1553; — Virakta...Caitanyakhacitātkāyānnātmā anyo astīti manyate—Nyāyamañjarī, pt. II, p. 3;

But in opposition to the view of Bhūtacaitanyavāda, the thoughts on the doctrine of rebirth, after-life and the doctrine of independent soul went on vigorously with the development of Indian Philosophy. It is not known who started this movement of this doctrine, when and where, but it is definite that there were many sects of the leaders, following this doctrine and they made speculation about it in their respective manners.¹

Acetanatattva (non-sentient principle) also can be traced back to Bhūtavāda (doctrine of material elements)² which arose out of the thought on the object of the senses, i. e. the objects apprehended by the senses. The starting of the search for this Acetanatattva took place with the thought on the objects experienced by the senses. It is known that some thinkers, having kept the perceptible world in view, which came

Pañca khaṁdhe vyaṁtege bālā u khaṇa joṇo
anno ananno nevāhu heuṇa ca āheuṇa ;

—Sūtrakṛtāṅga, 1. 1. 17 ;

Puḍhavi āyu teu ya, tahā vāyu ya egao

Cattāri dhāṇo rūvaṁ avamāhaṁsu āvare — Ibid., 1.1.18;

Cātumahābhūtika ayaṁ puriso yadā kālaṁ karoti—Dīgha-
nikāya, Sāmaññaphalasutta, Ajitakeśakambalavāda (3) 22;

Iti paḍhame purisajāe tajiṇvataccharīra tti āhie

Docce purisajāe pañcamahābhūtie tti āhie—Sūtrakṛtāṅga, 2

Poṇḍariya ākhyānavāda ; Sūtrakṛtāṅga's Nirukti (i)

gāthā, 30 and Gaṇadharavāda, p. 50 ;

Prthivyāpastejo vāyuriti tattvāni

tatsamudāye śārīrendriya viśayasamjñā —

Tattvopaplavasiṁha, p. 1; Tebhyaścaitanyamiti. tatra-

kecidvṛttikārā vyācaksate utpadyate tebhyaścaitanyam,

anye abhivyajyata ityāhuḥ—Tattvasaṅgrahapañjikā, p. 205;

Tam jīvaṁ tam sarīraṁ — Majjhimanikāya II, Cūlamā-

lunkīya sutta ; Yathā guḍapiṣṭhādayaḥ ... caitanyam

saprakṣayanti — Nyāyamañjarī, II, p. 3.

1. Bhāratīyatattvavidyā, p. 78.

2. Śvetāśvatara Upaniṣad, 1. 2.

first of all in thought, accepted the nature of the world as endowed with the five elements (pañcabhūtas¹ or pañcadhātus² or pañcaskandhas).³ On the basis of this postulation other thinkers began to make a clarification of the nature of Acetanatattva of Ajīvadravya.

As to the essential nature of six categories of Dravya (i. e. Reality) as determined by the two divisions of Dravya—Jīvadravya and Ajīvadravya in the Jaina Āgamas and the post-Āgamic works, it is explained that the five extensive substances, viz. Dharma (principle of motion), Adharma (principle of rest), Ākāśa (space), Jīva (soul), Pudgala (matter) and Kāla (time) the sixth substance, are permanent in their nature and fixed in number as the sole constituents of the universe; and all except pudgala are non-corporeal.⁴

Ācārya Kundakunda explains that the five extended reals manifest themselves in various forms through their numerous qualities and modifications and fill the three worlds.⁵ In other words, they are the constituents of the cosmic universe. They maintain their permanence through the manifestation of their various qualities and modifications and constitute the substance, i. e. Reality, together with time which is endowed with the quality of permanence-in-change.⁶ That is to say, "these five reals are being and becoming. They maintain

1. Svetāśvatara Upaniṣad, 1.2.

2. Dīghanikāya, Sāmaññaphala Sutta, see the view of Ajitakeśakambālī.

3. Sntrakṛtāṅga, 1. 1. 17.

4. Pañcatthikāe na kayāi nāsī na kayāi natthi, na kayāi na bhavissai bhuviṃ ca bhavai ya bhavissai ya dhuve niyae sāsaē akkhaē avvāē avatthiē nicce arūvī — Nandī-sūtra, 58; Poggalathikāyaṃ rūvikāyaṃ — Bhs., 7. 10. 305; TS., V. 4; PS., 22.

5. Jesiṃ atthisahāo guṇehiṃ saha pajjaehiṃ vivihehiṃ Je hoṃti atthikāyā nippanṇam jehiṃ tellokkaṃ — PS., 5.

6. Te ceva atthikāyā tekkaliyabhāvaaparīṇadā niccā Gacchaṃti daviyabhāvaṃ pariyattaṇaṇalīṃgasamjuttā, Ibid., 6

their identity in the midst of their changes and thus are characterized by three factors, viz. origination, decay and permanence in the process of birth and destruction.”¹ As time also possesses these three qualities so there are stated to be six fundamental substances. Ācārya Pūjyapāda, while commenting on the aphorism “Nityāvasthitānyarūpāṇi”, explains that the six substances, viz. Dharma (principle of motion), Adharma (principle of rest), Ākāśa (space), Jīva (soul), Pudgala (matter) and Kāla (time) are eternal and unchanging in their characteristics and except Matter all are devoid of form (i. e. non-corporeal); Dharma cannot become Adharma or Jīva cannot become Ajīva (non-soul). The number of Dravyas (substances) is fixed as six; it can never be seven or five and with the exception of Pudgaladravya (material substance), the other five Dravyas are non-material and non-corporeal, hence devoid of all characteristics of Pudgala, such as, colour, taste, smell and touch, etc.² Therefore, according to Jaina metaphysics, there are stated to be six categories of Reality called Sarvadravyas in the universe, i. e. positive fundamental reals characterized by qualities and modes, viz. principles of Motion and Rest, Space, Soul, Matter and Time.³

It is to be noted that in No. 2 aphorism of the fifth chapter of the Tattvārthasamgrahana Sūtra containing the Śvetāmbara tradition the word “Dravyāṇi” (substances) has been joined together with the word “Jīvāśca” (souls) to form this aphorism “Dravyāṇi Jīvāśca”. That is to say, Dharma and Adharma, Ākāśa, Pudgala and Jīva are the five fundamental extensive substances,⁴ and Kāla is not included here.

1. PS., 6. (comm).

2. Sarvārthasiddhi, pp. 270-71.

3. Chavviḥā savvadavvā pa. tamjahā-dhammatthikāe adhammatthikāe jāva addhāsamaye—Bhs., 25. 4. 733-4 ; 11. 4. 424; 13. 4. 482-3; Anuyogadvāra sūtra, 324 and Gommatasāra (Jīvakāṇḍa), 560.

4. Ete dharamādayaścatvāro jīvāśca pañca dravyāṇi ca bhavanti — TS. Bhāṣya, p. 320.

The Digambara tradition as preserved in the Sarvārthasiddhi, the Tattvārtha Rājavārtika and the Tattvārtha Śloka-vārtika avers that their No. 2 aphorism, ch. V., “Dravyāṇi” conveys the meaning that principles of Motion and Rest, Space and Matter are the substances (Dharmādharmākāśa pudgalāḥ dravyāṇi). According to this view, the aphorisms No. 3 and No. 39, ch. V, includes Souls and Time (Jīvāśca and Kālaśca) respectively in the categories of Reality as conceived in Jaina philosophy. As to the conception of six fundamental substances there is no difference between the two versions which are preserved in the Tattvārthādhigama Sūtra and in the Sarvārthasiddhi, the Tattvārtha Rājavārtika and the Tattvārtha Śloka-vārtika respectively, but only the formation of the Sūtras differs.

The Nyāya-Vaiśeṣika system of thought advocates the doctrine that there are stated to be nine substances (Dravyas), i. e. constituent elements of the Universe, viz. earth (pṛthivī), water (ap), fire (teja), air (vāyu), ether (ākāśa), time (kāla), direction or relative position (dik or diśā), soul (ātmā), and mind (manas).¹ Earth, water, fire, air and mind are incorporated into the category of pudgaladravya (material substance) of Jaina metaphysics. “These are characterized by colour, taste, smell and touch as the sense of sight”.² It is to be observed here that all these four qualities are inherent in all kinds of Matter—tangible and intangible to the senses and may or may not be apprehended by the physical senses simultaneously, and none of them are associated with other substances of the cosmic Universe.

The Vaiśeṣika school holds the view that air is devoid of

1. Pṛthivyāpastejo vāyurākāśakālo digātmā mana iti dravyāṇi —VS., 1.1.4; PP Bhā., p. 3; Tarkasaṃgraha, 2, p. 5.
2. Pṛthivyāptejo vāyumanāṃsi pudgaladravye antarbhavanti; rūparasagandhasparśavattvāt —Sarvārthasiddhi, p. 268; Pṛthivyāptejo vāyumanāṃsi tāvat pudgaladravyameva mūrtakriyāvattvād-ātmāpariṇamitā vā vasudhādayaḥ pudgalā jīvā eva manuṣyādivat — TS. Bhā. Tīkā, p. 321.

form.¹ Ācārya Pūjyapāda explains the point by refuting this view in the following manner : "It is not true to say that air and mind do not possess colour, taste, etc. Indeed air possesses colour and so on, as it touches like the pitcher and so on. If it is said that colour, taste and smell are absent in air because these are not perceived by the sense of sight, then it would lead to the negation of atoms also. Water is characterized by smell, as it possesses touch like earth. Similarly, mind also is of two kinds-physical mind and psychical mind. Therein the psychical mind is knowledge. And knowledge is the attribute of Soul. So it comes under Soul. As the physical mind is characterized by colour, taste, smell and touch, it is a modification of matter. The physical mind is characterized by colour, taste, smell and touch, for it is the cause of knowledge like the sense of sight."²

"It is contended that we do not see the air and mind producing the effect (Kāryatvaṁ) of colour, taste, etc., as we do in the case of atoms. We say that such an effect can be admitted that all atoms can produce effects containing (all) colours, tastes, smells, etc. There are no atoms of the class of earth, water, fire or air. For all activity proceeds with the intermixture of blending of classes."³ According to the theory of science, air can be converted into a "bluish liquid by continuous cooling just as steam can be converted into water."⁴ This scientific experiment demonstrates that air is endowed with the quality of colour and is therefore incorporated into the category of matter.

The Nyāya-Vaiśeṣika system of thought propounds the theory that fire is endowed with the quality of touch and colour⁵ only, but it is devoid of taste and smell, while air possesses

1. Sparsāvān vāyuḥ — VS., II. 1.4; Tarkasaṁgraha, 12.
2. Sarvārthasiddhi, pp. 268-9; Reality, p. 131.
3. Ibid., p. 269 ; Reality, 131.
4. Cosmology, Old and New, p. 78.
5. Tejo rūpasparśavat — VS. II. 1, 3; Tarkasaṁgraha, 11, 19.

only the quality of touch.¹

According to Jaina philosophy, air possesses not only colour and touch but also taste and smell. Modern science has clearly proved that it is a material substance, for when the energy (heat) of molecular agitation is very great, its temperature rises creating the sensation of fire. It is a form of energy which is a modification of matter, for energy is the attenuated form of matter and matter is a bottled energy. So they are identical. The qualities of matter are associated with fire, as it is demonstrated that "the flame consists of incandescent matter, raised to a high temperature by the process of combustion and that flame can exist only so long as the combustion goes on and a sufficiently high temperature is thereby maintained to render the burning matter luminous. The flame is the outward visible sign of certain chemical and physical process, of action and reaction between the material which is being burnt and the atmosphere which surrounds it."²

The Jaina Āgama, the Bhagavati Vyākhyāprajñapti throws a side light upon this theory of fire by making a similar scientific analysis of the burning of fire in a lamp in connection with the holy teachings of Mahāvīra in this way: A lamp, its stand, wick, oil and cover do not burn, but fire in the wick burns."³ It is the well-known theory that the oil of the lamp is sucked by the capillary action caused by the heat of fire burning at the tip of the wick. Therefore, fire is included in the category of Pudgaladravya (material substance).

According to the Nyāya-Vaiśeṣika school, earth possesses

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1. Tarkasaṃgraha, 13, p. 9; VS., II. 2. 4; Muktvāvalī, 42.
 2. Outlines of Evolutionary Biology, p. 2; Cosmology, Old and New, p. 79, foot note.
 3. Na paḍīve jhiyāi na laṭṭhi jhiyāi na vatti jhiyāi na tele jhiyāi, etc. Bhs., 9. 6. 333.

the natural quality of smell¹ together with colour, taste and touch. It is regarded by this system of thought that smell is existent only in earth, its presence in other substances like water, fire and air is not natural, but is "due to the mixture of the earthly particles with them."² Although odour is existent in them, it cannot be apprehended by the sense-organ of smell, i. e. the nose. For "Human nose is not sensitive enough to detect the smell of these. Several cases are known where our olfactory organ fails, for instance, the cat at once smells the milk or a hound smells the chase."³

Modern science has classified Matter into three states, viz. solid, liquid and gaseous states. Jaina metaphysics holds that Matter (pudgala) exists in the space of the Universe in the forms of earth (pṛthivī), water (jalaṁ), air (vāyu), etc.⁴ That is to say, they connote solid, liquid and gaseous states respectively and thus naturally come under the category of pudgala (matter).

In the Nyāya-Vaiśeṣika school Ākāśa (ether)⁵ is regarded as a material substance (bhautika dravya); it is endowed with all pervasiveness and it is a fundamental principle of creation. Besides, it is the pure space having the property of accommodation to give room to other substances. The Jaina systems of thought also maintains the view that Ākāśa is an eternal,

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1. Rūparasagandhasparśavati pṛthivī, VS. II, 1. 1; Lakṣaṇāvalī of Udayana, p. 18; Vyavasthitaḥ pṛthivyām gandhaḥ—VS. II, 2.3.
 2. The Conception of Matter According to the Nyāya-Vaiśeṣika, p. 317.
 3. Cosmology, Old and New, p. 78.
 4. Sūtrakṛtāṅga 1. 1. 17; Sarvārthasiddhi, p. 268; TS. Bhā. Tīkā, p. 321.
 5. Ākāśakāladigātmanāṁ sarvagatatvaṁ paramamahattvaṁ sarvasaṁyogisamānadeśatvaṁ ca—Bhā., p. 8; Pariśeṣāllīṅgamākāśasya—VS., II. 1. 27.

infinite substance with accommodation (avagāhana)¹ as its property, giving room to other five fundamental substances, viz. Dharma, Adharma, Jiva, Pudgala and Kāla. The reality of Ākāśa has also been accepted by all other Indian systems of thought like the Sāṃkhya², Theravāda Buddhism,³ the Vaibhāṣika⁴ and the Vedānta⁵ as the substratum of all other four elements (bhūtas), viz. earth, water, fire and air.

As regards Dik (direction) of the Nyāya-Vaiśeṣika system of thought it is conceived "as that from which the notions of the various directions are produced with reference to a particular finite (mūrta) object as the basis of our judgement."⁶

The Jaina conception of Ākāśa (space) includes Dik⁷ in its category, i. e. it is interpreted as mathematically pure space. "The convention of east, west, etc. in the series of rows of the points of space is based on the rise of the sun, etc.

1. Guṇao avagāhaṇāguṇe—Bhs., 2.10. 118.;
Avagāhaṇālakkhane ṇaṃ āgāsatthikāe, Ibid., 13. 4. 481.;
Uttarādhyayana Sūtra, 28. 9.; TS., V. 18.
2. Vāyorāvaraṇaṃ yadi hi avakāsarūpaṃ ākāśaṃ na syāt tadā mūrtadravyeṣu sthālyādiṣu antasteja ādipraveśo na syāt—
Yogavārtika, pāda III;
3. Abhidharmadīpa, p. 9 (Ākāśa-dhātu).
4. Anāsravā mārgasatyam trividham cāpyasaṃskṛtam
Ākāśam dvau nirodhau ca tatrākāśamanāvṛtiḥ — Abh.
K. i. kā.5; Avakāśam dadāti tyākāśamiti nirvacanam
bhīṣamasyāntaḥ kāśante bhāvā ityākāśamityapare — Abh.
K. I. Kā. 5, Sphuṭārthā.
5. Ākāśastallīṅgāt, Brahmasūtra, 1. 1. 22.;
Āsamanāt kāśata iti ākāśaḥ—Śrīnivāsa, Vedānta-Kaustubha
6. PPBha., p. 28; The Conception of Matter According to
Nyāya-Vaiśeṣika, p. 189.
7. Diśo'apyākāśe antarbhāvaḥ—Sarvārthasiddhi, p. 269.
Diśaścākāśānna dravyāntaram...diśāmastīti, TS. Bhā,
Ṭīkā, p. 321.

For instance, this direction is here (The east is in the direction of sunrise).¹

Ātmā (soul) and Kāla (time) are common to both the systems of thought—Jaina and Nyāya-Vaiśeṣika. Thus, the nine categories of Dravya (substance) of the Nyāya-Vaiśeṣika school can be reduced to the six categories of Dravya of Jaina philosophy.

Of the six categories of Dravya (i. e. Reality) as conceived in this system, Dharmāstikāya, Adharmāstikāya and Ākāśastikāya, among the non-living substances (ajīva-dravyas) are one continuum each, i. e. indivisible wholes or single substances.² Besides, they are immobile or without activity.³ According to Ācārya Pūjyapāda, Kāla (time) also has no capability of movement.⁴ He has raised the question here : "If Dravyas—Dharma, Adharma, etc. are not capable of movement from place to place, their utpāda (origination) should not take place; consequently there will be the negation of vyaya (decay) due to the negation of origination."⁵ It is clearly explained in connection with the conception of Dravya—Sat (Reality) and its nature that it is characterized by origination, decay and permanence.⁶ That is to say, origination and decay must take place in the six fundamental substances in some form or other. Ācārya Pūjyapāda himself solves the problem by explaining it in the following manner." By the authority of the scriptures infinite 'agurulaghuguṇas (qualities of neither heaviness nor lightness), which maintain individuality of substances, are

1. Sarvārthasiddhi, p. 269.

2. Dhammo 'adhammo āgāsaṃ davvaṃ ikkikkamāhiyaṃ aṇaṃtaṃ ya davvāṇi, kālo puggalajaṃtavo

—Uttarādhyayana Sūtra, 28.8;

Ākāśādekadravyāṇi—TS., V. 5.

3. Niskriyāṇi ca, TS., V. 6.

4. Sarvārthasiddhi, p. 274.

5. Ibid., p. 273.

6. Utpādavyayadhrauvyayuktaṃ sat, TS., V. 29.

admitted. These undergo six different steps of rhythmic rise and fall (increase and decrease). Origination and decay are established by these changes".¹

It means that "Among the six common attributes, viz. *astitva* (existentiality), *vastutva* (functionality), *dravyatva* (changeability) *prameyatva* (capacity of being the subject of knowledge), *agurulaghutva* (individuality or neither heaviness nor lightness) and *pradeśatva* (capacity of having some form), *agurulaghuguṇa* is such that an imperceptible rhythmic rise and fall is constantly taking place in its parts in six different steps and these natural rhythms-rising and decaying produce *utpāda* and *vyaya*. *Agurulaghu* attribute is said to be responsible for maintaining the individuality of a substance and its characteristic properties".²

So six fundamental substances, viz. *Dharmāstikāya*, *Adharmāstikāya*, *Ākāśastikāya*, *Jivāstikāya*, *Pudgalāstikāya*, and *Addhāsamaya* or *Kāla*, have been conceived by the Jaina thinkers as six categories of Reality through their experience and critical analysis of the noumenal and phenomenal aspects of it, and of eternal sentient principle (*Jīvatattva*) and non-sentient principle (*Ajīvatattva*) of the existing Universe. This conception of Reality with its nature reveals that *prāṇītatva* (principle of beings) and *Jaḍatattva* (principle of non-being) come into being and are becoming. In this way they avoided the question of creation and beginning. These six categories of Reality are characterized by the three potent factors, viz. origination, decay and permanence. They are not *Kūṭasthanīya tattvas* (absolutely unchangeable reals) like those of the *Sāṃkhya* and *Vedānta* schools of thought., i. e. *Puruṣa* and *Brahman* respectively. They are eternal, independent and permanent reals from the point of view of substance (*Dravya*), yet they are

1. *Anantānāmagurulaghuguṇānānāgamapramāṇyādabhyupagamyamānānām śaṣṭhāpanapatitayā vṛdhyā hānyā ca pravartamānānām svabhāvādetekām utpādo vyayaśca—Sārvarthasiddhi*, p. 273.

2. *Cosmology, Old and New*, p. 100.

also changing in nature from the modal point of view, as they are conceived from the aspects of their infinite *guṇas* (qualities) and *paryāyas* (modes). There are infinite living and non-living substances possessing infinite *guṇas* and infinite *paryāyas*.¹

In the midst of the series of eternal and infinite changes taking place in the aforesaid six substances they persist as *Pariṇāmīnitya Dravyas* (permanent-in-change substances).

Concept of Matter (Pudgala) :

Matter has been studied by every system of Indian philosophy in its own manner. *Bhūta* of the *Cārvākas*,² *Prakṛti*³ of the *Sāṃkhya-Yoga*, *Jaḍadravya*⁴ of the *Nyāya-Vaiśeṣika*⁵ and the *Mīmāṃsakas*,⁶ *Rūpa*⁷ of the Buddhists, *Māyā*⁸ of the *Śāṅkara-Vedānta*, *Acit*⁹ of the *Rāmānuja-Vedānta* and *Pudgala*¹⁰ of Jaina philosophy are only diverse views on this problem.

The concept of Matter can be traced back to *Bhūtavāda*¹¹ (doctrine of elements of Matter) which arose out of the Indian speculative thought on the objects of the sense in the Upaniṣadic period. As pointed out, on the basis of the postulation of the nature of the world as endowed with five elements (*pañca-bhūtas*¹² or *pañcadhātus*¹³ or *pañcaskandhas*)¹⁴ some thinkers

1. Bhs, 25. 2. 720.

2. *Tattvopaplavasīmha*, p. 1.

3. *Sāṃkhyakārikā*, VV. 8, 10, 11.

4. *Vaiśeṣika Sūtra*, 1. 1. 5.

5. *Praśastapādabhāṣya*, p. 16; *Nyāyakandali*, p. 16.

6. *Prabhākara Mīmāṃsā*, pp. 35 ff.

7. *Abhidharmakośa*, 1. 24.

8. *Kacinmāyeti sūcitam māyām tu prakṛtiṃ vidyānmāyinantu maheśvaramiti mantravarṇāt — Śāṅkarabhāṣya* on *Brahmasūtra*, 1. 43.

9. *Śrībhāṣya*, 1. 43.

10. *Bhagavati Sūtra*, 2. 10. 118.

11. *Svetāśvatara Upaniṣad*, 1. 2. 12. Ibid.

13. *Dīghanikāya*, *Sāmaññaphalasutta*, the view of Ajitakeśa-kambali.

14. *Sūtrakṛtāṅga*, 1. 1. 17-18

began to clarify the nature of the non-sentient principle (Aceanatatva or Ajivatattva) the most visible form of which is Matter.

Kṣiti (earth), ap (water), tejas (fire), vāyu (air) and ākāśa (ether) are called the five elements of Matter (pañcabhūtas)¹. They are also known as five aggregates of matter (pañcaskandhas)². The words 'dhātu'³ and 'kāya'⁴ also are used in this sense. Later on, the word 'dravya',⁵ was employed for this 'bhūta' indicating the elements of matter. There is no difference of opinion in regard to earth, water, fire and air—the four entities, as being tangible to the senses. Ākāśa⁶ was accepted unanimously by some Indian schools of thought as the container of these four elements. In this sense of realities the word 'bhūta' was used by the ancient Indian thinkers that these entities which exist by themselves are also real.

Just as some tree stands on the base of its trunk, just so the structure of the material universe is standing on the foundation of these aforesaid five elements. Therefore, these elements—earth, etc., are called 'Skandhas.'⁷

The meaning of 'dhātu' is explained in this way : that which maintains and nourishes the universe is called 'dhātu', just as vāta (air), pitta (bile) and kaph (phlegm)⁸ are called

1. Śvetāśvatara Upaniṣad, 1. 2.

2. Sūtrakṛtāṅga, 1. 1. 17-18.

3. Abhidharmakośa, 1. 20. It seems that "Dhātu has been borrowed from medical science where it means elements of body".

4. Bhagavati Sūtra, 33. 1. 844 Puḍhavi-kāya, ap-kāya, etc.

5. Vaiśeṣika Sūtra, 1. 1. 5.

6. Ākāśa has been accepted as space-container of all others substances by the Jains (Tattvārtha Rājavārtika, p. 434) and the Vaibhāṣikas respectively (Abhidharmakośa, K. 1. Karikā 5, Sphuṭārthā).

7. Abhidharmakośa, Commentary on K. 1. 2.

8. Carakasāhita, Śarīrasthāna.

'dhātu' because of their being the maintainer and nourisher of the human body. The meaning of the word 'kāya' is the organic body or figure in the Indian literature. The five entities—earth, etc. are called 'kāyas'¹ (bodies) because of their being of different shapes or figures. These entities are called 'dravyas'² (substances) on account of the continuity of their various tangible qualities and actions or modes in the womb of space and time. Similarly, such a doctrine that the universe is composed of five elements (pañcabhautika) has emerged with the development of Indian metaphysical thought. A reference to these five elements (bhūtas)³, earth, water, fire, air and ākāśa is found in the Upaniṣads,⁴ the Buddhist Piṭakas⁵ and the Jaina Āgamas.⁶ But the Indian speculation about Acetanatattva (non-sentient principle) went on more and more and it turned towards the subtle cause from the tangible gross cause of the material universe. The group of advocates of the concept of five elements of matter fell apart from that of the speculators of the finest cause of Acetanatattva. The first group of thinkers stopped there and began to establish the concept that there was nothing else except the five elements of matter (bhūtas). This concept is known by the name of Bārhaspatya, Lokāyata or Cārvāka.⁷

One tradition of Indian schools of thought accepting the concept of four elements of matter (bhūtas)⁸ without ākāśa (ether or sky) was also continuing in the field of metaphysical

1. Bhagavatī sūtra, 24. 16. 702-709.

2. Pṛthivyāpastejo vāyurākāśaṁ iti dravyam, —. VS.
1. 1. 4.

3. Nyāyamañjarī, Pt. II.

4. Śvetāśvatara Upaniṣad, 1. 2.

5. Dīghanikāya, Sāmaññaphalasutta; see the view of Ajitakeśakambalī.

6. Sūtrakṛtāṅga, 1. 1. 17.

7. Dīghanikāya, Sāmaññaphalasutta;
Tattvopaplavasiṁha, p. 1.

8. Ibid, p. 1.

speculation of non-sentient principle in course of time. On the other side those Indian thinkers who were not satisfied with the concept of the five elements of matter apprehended by the senses began to speculate about the cause of these reals and their nature. In this way two currents of thought on the problem of non-sentient principle arose in the field of Indian metaphysics, giving birth to the concepts of Matter. One group of Indian thinkers started to find out the fundamental cause out of the material realities on the basis of inner feeling and thought, while the other group began to think over the nature of the fundamental cause mainly on the basis of the sense-experience. The Sāṃkhya and Brahmavādina views on it represent the first current of thought and Nyāya-Vaiśeṣika, Buddhist and Jaina views on this problem represent the second one.

According to Jaina metaphysics, the most visible form of Ajīva-dravya (non-living substance) or Acetanatattva is Pudgalāstikāya (matter) which exists in the Universe in various forms, such as, earth, water, fire, air, shadow, objects of four senses—hearing, smell, taste and touch, physical mind, speech, bodies, etc. up to karmic matter and paramāṇu¹ (ultimate atom). Pudgala is a tangible reality within the sensuous and supersensuous experiences in perceptible and imperceptible conditions. Its finest form is paramāṇu (ultimate atom). The concept of Pudgala preserved in the Jaina Āgamas forms the basis of the physical sciences in Jainism in a nascent form. On it a superstructure of analysis of Pudgala has been raised by Umāsvāti and other Jainācāryas in post-āgamic period and darśanakāla (age of Indian philosophy) with a synthetic view of all other Indian concepts of Matter on the basis of its existence in the Universe as a permanent substance endowed with infinite qualities (guṇas) and modes (paryāyas)² which

1. Puḍhavi-jala-chāyā-caurimḍiyavisaya-kamma-khaṇḍha-paramāṇu—Śaṭkhaṇḍāgama, Vol. III, p. 3;

Pañcāstikāyasamayāsāra, 83, p. 81; Gommatasāra, Jivakāṇḍa, V. 602.

2. Bhs., 5. 8. 221; 2. 1. 90.

can be studied in the light of many unique notions of matter as explained in the physical sciences.

Etymology of 'puggala' or poggala,¹ Skt. pudgala, has been dealt with by the Jainācāryas², Bauddhācārya,³ different foreign⁴ and Indian scholars including Sri S. M. Shah⁵ of Poona University in their respective manners of scholarly approach to the problem. According to the consensus of opinions of all scholars, the basic etymological meaning of the word 'puggala' is that the substance which undergoes transformation or modification by the process of integration and disintegration⁶ is called puggala or poggala, Skt. pudgala, although it still remains as a problem to be solved, as it has been used in the sense of both Matter and Soul or empirical being in the Jaina tradition⁷ and Soul or personality in the

1. TS., V. I.

2. Pūraṇādgalanācca pudgalaḥ etc.. Tattvārthādhigamasūtra, Ṭīkā by Siddhasena Gaṇin on V. 7, p. 316.

Pūraṇāgalanānvarthasamjñātvāt pudgalaḥ, etc.. —

Tattvārtha Rājavārtika, V. 19, Ṭīkā; Puṁgilādvā...athavā pumāṁso jīva te śarīrāhāraviśayakaraṇo pakaraṇādibhāvena gilanta iti pudgalāḥ— Ibid.; Poggale iti pūraṇādgalanācca śarīrādīnām pudgalaḥ— Bhagavati Vyākhyāprajñāpti Vṛtti, Vol. III, pp. 776 ff.;

Pūraṁti galaṁti jado pūraṇāgalanehi poggalā tena paramāṇuciya jādā iya diṭṭhaṁ diṭṭhi kāyāmi — Tiloyapaṇṇatti, pt. I, ch. I, V. 99.

3. Visuddhimagga, 310.

4. Prof. P. Desco, Sanskrit 'pudgala', body, soul, — Journal of American Oriental Society, Vol. 67, pp. 172-77; Prof. Franklin Edgerton, Buddhist Hybrid Sanskrit Grammar and Dictionary, Vol. II, Delhi, 1970, p. 347; Pāli-English Dictionary. Dravidian Etymological Dictionary, Oxford, 1961, Word No. 3494, p. 283.

5. Śrī S. M. Shah, On the Etymology of Pudgala or Poggala, Sambodhi, Vol. 4, Nos. 3-4,

6. Tattvārthādhigamasūtra, Umāsvāti, p. 316

7. Bhs. 20. 2. 664.

Buddhist tradition¹ respectively. So the nature of Puggala, according to the accepted Jaina tradition, is to integrate and disintegrate.² On account of this nature of its name 'Puggala' or 'poggala', Skt. 'Pudgala' has been attributed to the permanent substance—Matter in Jaina philosophy.

This Jaina concept of Matter may be compared with the concept of matter in the physical sciences to some extent where it is conceived as the substance in the sense of stuff of which the material Universe is constituted, undergoing changes by the process of integration and disintegration.³ So the concept of Matter of the Jainas comes nearer to that of matter of the physical sciences in some respects. In Jaina metaphysics matter is conceived as a substance (dravya) endowed with quality (guṇa) and mode (paryāya)⁴ and it is studied from the aspects of substance (dravya), locus, (kṣetra) time (kāla and condition (bhāva)⁵ on the basis of the metaphysical speculation which runs parallel to some extent to the conception of Matter as found in Western philosophy and modern physics in which Matter is conceived as one of the ultimate principles of substances of which phenomena are manifestations.

According to Jaina philosophy, Matter (pudgala) is a permanent, non-living, extensive, physical, corporeal and concrete, active, disintegrating and integrating, and changeable substance.⁶ It is infinite in number, co-extensive with the Universe (Loka), possessed of the capacity to be received by

1. *Kecit Saugatammanyā apyātmānam pracakṣate, pudgala-vyapadeśena tattvānyattvādivarjitam—*
Tattvasaṁgraha 336, Śāntarākṣita, Gaekwad's Oriental Series.

2. Bhs. (Comm.) 20. 2. 664, etc.

3. *Cosmology, Old and New*, pp. 58-64; See also *Physics*, p. 2.

4. *Bhagavati Vyākhyāprajñapti*, 2. 10. 118; *Anuyogadvāra*, 4. 727 ; *Uttarādhyayanasūtra*, 28, 5-6.

5. Bhs., 2. 10, 118.

6. Bhs., 2. 10. 118; TS. V. 1, 2. 3, 4, 6; *Dravyasaṁgraha*, 15.

Soul¹ and to be of assistance to it.² It is characterized by origination, decay and permanence without giving up its essential nature of existence.³

A comparative study of the Jaina concept of Matter with those of other Indian systems of thought reveals that according to the Sāṃkhya there is Prakṛtitattva (Primordial Matter) among many successive changes, ever existing and all-pervading; again, however, it is itself attaining also other states in accordance with the changes. Of course it is formless, unmanifest and undifferentiated like atoms of Jaina metaphysics in its unmanifest states.

The Nyāya-Vaiśeṣika maintains the view that when newer and newer effects like substances, etc. get produced, then an atom (paramāṇu) as the basis of these effects exists as Kūṭasthanitya (absolutely permanent) without any kind of change. According to Jaina metaphysics also, an atom too is the basis of newer and newer material effects. Nevertheless, atoms are not by any means different and independent from the effects like those of the Nyāya-Vaiśeṣika. But there is one point which is the same in the Sāṃkhya, Nyāya-Vaiśeṣika and Jaina systems of thought that the individuality or self-identity of the fundamental substance as substratum is to remain as whole or non-divisible (akhaṇḍa). As, according to the Sāṃkhya view, the identity of Prakṛtitattva exists as whole or non-divisible from the points of view of all-pervasive substratum⁴, just so the infinite-fold infinite atoms exist as permanent,

1. Bhs., 2. 10. 118; Sakaṣāyatvājīvaḥ karmaṇo योग्यं pudgalānādatte—TS., VIII. 2.

2. Sukhaduḥkhajīvitamaraṇopagrahāśca. TS., V, 20, p. 343.

3. Apariccattasahāvenuppadavvayadhuvattasamjuttam
Guṇavaṃ ca sapajjāyam jaṃ tam davvaṃ ti vuccanti
—Pañcāstikāyasāra, II, 3.

4. Mūlaprakṛtiravikṛtirmahādādyāḥ prakṛtīvikṛtayaḥ sapta
śoḍaśakastu vikāro na prakṛtirna vikṛti puruṣaḥ
—Sāṃkhyakārikā, 3.

according to the Nyāya-Vaiśeṣika¹ and Jaina² concepts of Matter. The Buddhist philosophy calls the Universe rūpātmaka (material). Rūpa does not connote only the meaning 'perception' to the eye, but it calls all the bhūtabhautikatattvas (primary and secondary elements of matter) by this term which can be apprehended by the sense-perception. Like the Nyāya-Vaiśeṣika and Jaina schools of thought the Buddhist philosophy also, keeping in view the perceptible gross matter, material effects like taste, etc., as prominent, was engaged in the consideration of its cause. It has also admitted the doctrine of similarity in the postulation of causality (kāryakāraṇa), i. e. as there is an effect, so there is a cause. If the material effect is perceptible to the senses of taste, etc., then its fine, finer and finest (i. e. intangible) ultimate cause also is as such, that is to say, it can be only as rūpa (colour and shape), rasa (taste), gandha (smell), sparśa (touch), etc.

According to this consideration, the Buddhist philosophy has made a reference to all gross and fine elements of matter of the universe by using the word 'Rūpa'. But there is a gulf of difference between the Buddhist concept of Rūpa and the Nyāya-Vaiśeṣika and Jaina concepts of Rūpa. The Buddhist tradition also is aṇu-paramāṇuvādin (advocate atomism) like the Nyāya-Vaiśeṣika and Jaina systems of thought. Nevertheless, its postulation of the concept of Matter appears to be distinct from Prakṛtivāda of the Sāṃkhya on the one hand and the doctrine of eternal and infinite ultimate atoms (anantaparamāṇuvāda) of the Nyāya-Vaiśeṣika and Jaina schools of thought on the other.

The Buddhist philosophy is the advocate of manifoldness (or multiplicity) of elements of matter, but it does not admit the conception of permanence of any entity. It advocates that

1. Āśritatvaṃ cānyatra nityadravyebhyaḥ anāśritatvānityatve cānyatra avayavidravyebhyaḥ—PPBha, Dravyadhāraṇāprakaraṇa.
2. Nityāvasthitānyarūpāṇi—TS., V. 3;
Rūpinaḥ pudgalāḥ—Ibid., V. 4.

the constitution of reality is always subject to change or being changed. It does not accept the change in entities under the influence of an independent reality called time, but it calls the series of evolving momentary changes due to the intrinsic nature of an entity as time. By this method, like the Sāṃkhya and Jaina systems of thought, it does not admit any such reality as ever existing (i. e. permanent) in the current of the would-be newer and newer changes at every moment, but it accepts ever dynamic momentary changes.¹

Nature of Matter

A detailed analysis of the characteristics² of Pudgala(Matter)

1. Bhāratīyatattvavidyā, p. 63.
2. It is a non-living Substance (Ajīvakāyā dharmādharmā-kāśapudgalāḥ dravyāṇi jīvāśca TS., V. 1-2;
it is eternal and permanent (Nityāvasthitānyarūpāṇi ca rūpiṇaḥ pudgalāḥ), TS., V. 3—4;
it is non-living (Bhs., 2. 10. 108; TS., V. 1);
it is extensive (Pamcatthikāyā paṇṇitā...poggalatthikāe), Bhs., 2. 10. 118;
it is endowed with body (Bhs., 2. 10. 118; TS., V.1);
it is corporeal and concrete (Rūpiṇaḥ pudgalāḥ), TS., V. 4; DS., 15.;
it is active (Pudgalajīvāstu kriyāvantah), TS. Bhāṣya, V. 6, p. 236.
it is subject to dissociation and combination (pūraṇādgalanācca pūḍgalāḥ), TS. Bhāṣya, V. 1, p. 316;
it is changeable (Bṛhad-Dravyasaṃgraha, p. 67(DS.,) p. 31)
it is finite (Davvao ṇaṃ poggalatthikāe aṇaṃtāim davvāim) Bhs. 2. 10. 118.;
it is co-extensive with the Universe (Khettao loyappamāṇa-mette), Bhs., 2. 10. 118;
it is possessed of the capacity to be received by Soul (Sakaṣāyatvājjīvaḥ karmaṇo योग्यान pudgalānādatte), TS., 8.2.;
it is of assistance to soul (Sukhaduḥkhajīvitamarāṇopagrahāśca) TS., V. 20.

as conceived in Jaina metaphysics throws light upon its nature. It is explained in the Jaina Āgamas and post-Āgamic works that Matter is eternal and constant in number; it was in the infinite eternal past samayas (times or instants), is at the eternal present samayas and will be in the infinite eternal future samayas.¹ On the basis of the Āgamic statement about the characteristics of Matter, Umāsvāti² and other later Jainācāryas have dealt with the nature of eternality attributed to it in detail. Ācārya Pūjyapāda explains it by maintaining that Matter never loses its general characteristics of existence, etc. and particular characteristics, such as, colour, etc. because these are indestructible characteristics like colour in it. It is fixed in number, for there does not take place any increase or decrease in its number, i. e. it remains constant.³ The qualities-eternality and fixity in number exist together in all substances permanently. To be eternal is not to lose its nature of permanence-in-change, i. e. that whose nature is not destroyed and that which is not destroyed by any means is eternal.⁴ "Since the fixed number is not violated, the substances remain fixed in number and do not at any time exceed fixed unit of six, so these are said to remain constant."⁵

Matter endowed with its quality and mode is eternal and fixed substance. Therefore, it will never be destroyed nor will it be converted into other substances.⁶ That is to say, Matter will remain the same as it is; whatever material substance there was in the past, (that much) is at present and will be in the infinite future. So it is eternal and fixed in quantity from the point of view of Dravya (substance). Matter which is non-living and by all means opposite to Soul is devoid of sentiency and consciousness, while the characteristic of Soul is conscious-

1. Bhs., I. 4. 42.

2. Nityāvasthitānyarūpāṇi, TS., V. 3.

3. Sarvārthasiddhi, p. 270.

4. Tadbhāvāvyayaṁ nityaṁ TS., V. 30.

5. Sarvārthasiddhi, pp. 270-71.

6. TS., Bhāṣya Ṭīkā, p. 323.

ness.¹ Hence, Matter is not living because of being devoid of consciousness, but it is non-living.²

In regard to the nature of its existence it is explained that Matter is real,³ for *astitva* (existence) is the only one all-comprising characteristic of the five extensive substances amongst their various characteristics.⁴ It is the nature of the substances.⁵ That is to say, this nature is accompanied by its qualities and variegated modifications and origination, destruction and permanence for all times.⁶ So Matter is *Traikālikāsti* (existent in three points of time—past, present and future).⁷

Matter is *rūpin* (corporeal)⁸ and *mūrta* (concrete or tangible).⁹ The auto-commentary of the *Tattvārthādhigama sūtra* explains that *rūpa* (corporeality) is *mūrti* (concreteness),¹⁰ while Siddhasena Gaṇin elucidates the point by stating that *pariṇāma* (resultant effect or transformation) of the aggregation

1. *Upayoga lakṣhaṇe jīve*,—Bhs., 2. 10. 118;
 Upayogo lakṣaṇam—TS., II. 8, p. 149.
2. TS. Bhā. *Ṭīkā*, p. 315.
3. *Asti ityayaṁ nipātaḥ kālatrayābhidhāyin*—Bhs. 2. 10. 118 (comm.)
4. *Iha vivihalakkhaṇāṇaṁ lakṣhaṇamegaṁ saditi savvagayaṁ*,
 —*Pravacanasāra*, II. 5, p. 13.
5. *Astitvaṁ hi kila dravyasya svabhāvaḥ*, *Ibid.*, p. 127,
 Pradīpikā.
6. *Sabbhāvo saḥāvo guṇehiṁ saha pajjahiṁ cittehiṁ*
 Davvassa savvakālaṁ uppādavvayadhuvattehiṁ,
 PR. II, 4, p. 126.
7. *Asti ityayaṁ nipātaḥ kālatrayābhidhāyin* — Bhs., 2. 10. 118 (comm.)
8. Bhs., 2. 10. 118; 13. 4. 481; *Rūpiṇaḥ pudgalāḥ* — TS., V. 4;
 Rūpaṁ mūrtiḥ — TS. Bhā., p. 322.
9. *Rūpaśabdasyānekārthatve mūrtiparyāya-grahaṇaṁ*
 śāstrasāmarthyāt — T. RV., V. 5. 1, p. 441,
10. *Rūpaṁ mūrtiḥ, mūrtyāśrayāśca sparśādāya iti* — TS. Bhā.
 V. 4, p. 322.

of colour, taste, smell, touch and shape is rūpa.¹ The things which have corporeality are the material objects.² Matter is called rūpin, i. e. mūrta (concrete) because of pariṇāma (transformation) produced by the aggregation of colour, taste, smell, touch and shapes like triangular, rectangular, etc.³ It is defined that rūpapariṇāmī guṇas (corporeality—producing qualities), viz. touch, taste, smell and colour become forms of matter,⁴ i. e. forms of matter are characterized by touch, taste, smell and colour. According to Siddhasena Gaṇin, guṇa (quality), which is inherent in a Dravya (substance) but non-existent in other Dravyas (substances), is called lakṣaṇaguṇa (distinctive quality) and that by which an object can be determined is the characteristic of it.⁵ One object can be distinguished from another by its lakṣaṇaguṇa. Matter only is rūpin (corporeal), while other fundamental substances are arūpin (non-corporeal). That which is rūpin is mūrta. Mūrtatva (concreteness or tangibility) of Matter is brought about by particular pariṇāma (viśiṣṭa pariṇāma) of colour, taste, smell and touch.⁶ Therefore, a thing which is rūpin is Pudgaladravya (material substance)⁷, no form of Matter can be arūpin, i. e. devoid of colour, taste, smell, and touch.⁸ Rūpitva (corpo-

1. Mūrtirhi rūpādiśabdābhidheyā, sā ca rūpādi saṁsthānapariṇāmaḥ, TS. Bhā. Ṭīkā, p. 323.

2. Rūpameṣāmasti rūpiṇaḥ, Ibid., p. 322.

3. Tattvārtha Rājavārtika, p. 444.

4. Sparśarasagandhavarṇavantaḥ pudgalāḥ — TS., V. 23, p. 355; Sparśaḥ rasaḥ gandhaḥ varṇa ityevaṁ lakṣaṇāḥ pudgalā bhavanti — TS. Bhā., p. 355.

5. Lakṣyate aneneti lakṣaṇaṁ, Ibid., II. 8, p. 149.

6. Rūparasagandhasparśā eva viśiṣṭapariṇāmānugṛhitāḥ santi mūrtivyapadeśabhājo bhavanti — TS. Bhā. Ṭīkā, V. 3, p. 324.

7. Pudgalā eva rūpiṇo bhavanti, rūpameṣāmastyeṣu vā astīti rūpiṇaḥ—TS. Bhā., p. 325.

8. Na mūrtivyatirekeṇa pudgalāḥ santi — TS. Bhā. Ṭīkā, V. 4, p. 325.

reality) can never be apart from Matter. That in which there is arūpitva (non-corporeality) is not Pudgala¹ (Matter). Samavāya (inherence) of colour, taste, smell and touch in Matter is called rūpitva. The aggregation of these four qualities is called rūpatvaguṇasamavāya of Matter; colour or shape (varṇa or saṁsthāna) alone is not called rūpatvaguṇa. Wherever there is colour, there are certainly touch, taste and smell.² There is no such form of matter in which there can be found only three or any two or any one of them. None of them can be perceived to exist in other substances. These four qualities must be present in all forms of Matter whether atoms or molecules.

They exist also in all conditions of it—tangible or intangible, manifest or unmanifest. Akalanka maintains that Saṁsthāna (shape or figure) also is one of the characteristics of tangibility or corporeality of Matter besides varṇa (colour) rasa (taste), gandha (smell) and sparśa (touch). The meaning of saṁsthāna is ākṛti or ākāra (shape or figure), it can be the product or effect of the disintegrating and integrating nature of Matter.³

Matter is active.⁴ In Jaina philosophy Sat (reality) is characterized by origination, decay and permanence⁵; it is the basic principle of the Universe.⁶ All substances are permanent by their respective inherent co-existing qualities, while they are origination and decay—like by their respective, successive modes. The mode of substance arising from internal and external causes, which is the cause of its motion, is called

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1. Arūpāḥ pudgalā na bhavanti—TS. Bhā. Tīkā, V.4, p. 324.
 2. Yatra rūpapariṇāmaḥ tatṛāvasyantayā sparśarasagandharirapi bhāvyaṁ, ataḥ saḥacarametaccatuṣṭayam,—Ibid., p. 323.
 3. Rūpādisaṁsthānapariṇāmo mūrtiḥ,—Tattvārtha Rājavārtika, V. 5, 2, p. 444.
 4. Pudgalajīvaṣṭu kriyāvantaḥ—TS., V. 6, p. 326.
 5. Utpādavyayadhrauvayayuktaṁ sat, TS., V. 29, p. 374.
 6. TS., p. 327.

activity (Kriyā)¹. The entities are inactive from the point of view of quality. An entity can be called inactive by the prominence of the substantial stand-point and the non-prominence of the modal stand-point.² All entities are active from the aspect of origination and decay of their modes. They are active by the prominence of the modal point of view and the non-prominence of the substantial point of view.³ All substances are endowed with qualities and modes, therefore, they are inactive and active respectively. The permanence of quality in a substance can be called inactivity, while the origination and decay of mode in it are to be called activity, (Kriyā), modes of a substance are infinite, so there are stated to be infinite divisions or conditions of activity. Both Arthaparyāya and Vyañjanaparyāya⁴ take place in Soul and Matter.⁵ There are two kinds of bhāva (condition), viz. parisvandātma (vibrating) and aparisvandātma (non-vibrating).⁶ It is explained that Matter and Soul are active "Pudgalajīvastu kriyāvantaḥ"⁷. Activity has been stated to be characterized

1. Ubhayanimittavaśādutpadyamānaḥ paryāya dravyasya deśāntaraprāptihetuḥ kriyā—Sarvārthasiddhī, p. 272.
2. Anutpādavyayotpādavyayadrśanāt (25) paryāyārthikaguṇabhāve dravyārthikapṛādhānyāt sarve bhāvā anutpādavyayadarśanāt niṣkriyā nityāśca—TRV., p. 449.
3. Dravyārthikaguṇabhāve paryāyārthikapṛādhānyāt sarve bhāvā utpādavyayadarśanāt sakriyā anityāśceti—TRV., p. 449.
4. Arthaparyāya signifies those minute or subtle divisions in a series of changes, which are or appear to be indivisible, no name can be attributed to it, while vyañjanaparyāya indicates a series of changes which has such similarity as to allow it to be stated by a name—Sanmatitarka, III, 34, p. 440.
5. Jivapūdgalānām arthaparyāya-vyañjanaparyāyasca,—PRTV, II, 37, p. 182.
6. Dravyasya hi bhāvo dividhaḥ parisvandātmakaḥ aparisvandātmakaśca,—TRV., 5, 22, 11, p. 481.
7. TS. Bhā. V. 6, p. 326.

by vibration or oscillation (parispandana). Vibration is the nature of Matter; activity takes place in it due to this vibrating nature and it is capable of being active.¹ Only by its capacity of vibration (parispandana śaktiguṇa). Therefore, it is active by its own capacity.²

In regard to the integrating and disintegrating nature of Matter it has been pointed out that the name 'Pudgala' is attributed to Matter because of its nature of integration and disintegration.³ A name is given to a thing according to its nature and activity.⁴ Matter integrates and disintegrates; the first cause of it is paramāṇu⁵ (ultimate atom), i. e. paramāṇu is the ultimate finest eternal cause and last unit of Matter. On account of their mutual touch or contact one paramāṇu sometimes integrates with another, and being united, again it sometimes disintegrates from a skandha (molecule) or combination in accordance with some scientific rules and so on. This process of integration and disintegration of paramāṇus takes place due to the integrating and disintegrating nature of Matter (Pudgala). Paramāṇus, being combined thus, transform themselves into the form of oneness. The name of this form of one state is called

1. Pudgalāstu parispandasvabhāvatvāt parispandena bhinnā saṁghātenā, saṁhatā punarbhedenotpadyamānāvatīṣṭhamānabhajyamānā kriyāvantaśca bhavanti—Pravacanasāra, II, 37, Pradīpikāvṛtti, p. 182.
2. Sāmarthyāt sakriyau jīvapudgalaviti niścayaḥ, Tattvārtha Śloka-vārtika, 5.7.2, p. 398.
3. Pudgalaśabdo nirdiṣṭārthaḥ (40) Pudgalaśabdasyārtho nirdiṣṭaḥ puṁgilanāt pūranaganādvā pudgala iti, —TRV., p. 474.
4. Pūryante galanti ca Pudgalāḥ dhātostadarthātīśayena yogaḥ mayūrabhramarādivat—Śrutasāgara Vṛtti, Vide Jaina Padārthavijñāna men Pudgala, Mohalal Bathia, p. 25.
5. Kāraṇameva tadantyaṁ sūkṣmo nityaśca bhavati paramāṇuḥ ekarasagandhavarṇo, dvīparśaḥ kāryalīṅgaśca —Ārya, TS. Bhā., p. 365.

Skandha¹ (molecule). There takes place also the union of one skandha (molecule) with another or more than one skandha like that of paramāṇu. On the division of the aggregate of paramāṇus, the disintegration occurs not only in the form of paramāṇus but it may happen also only in the form of skandha and in a mixed form of skandha and paramāṇu. The dissociation of some paramāṇus can take place only on the division of a skandha. The remaining skandhas may exist as they are. There can be a union of one or more paramāṇus with skandhas. The ultimate capacity and multifariousness of Matter are generated by its integrating and disintegrating nature.

As to the changing nature of Matter it is explained in Jaina metaphysics that Matter undergoes both ādi and anādi Parīṇāmas (transformation with a beginning and without a beginning)² Its ādi parīṇāmas are found in the transformation of its colour, taste, smell, touch, space, union, division, motion, sound and neither heaviness nor lightness,³ while its anādi parīṇāmas are experienced in its dravyatva (substantiality), mūrtatva (corporeality or tangibility), sattv (existentiality),⁴ etc.

Matter is infinite in number or quantity from the points of view of dravya (substance), kṣetra (locus), kāla (time) and bhāva⁵ (condition). That is to say, it is infinite in number whether it is in the form of paramāṇu or skandha.

1. Pariprāptabandhaparīṇāmāḥ skandhāḥ

—TRV., 5. 25. 16, p. 493.

2. Anādirādimāṁśca, TS., V. 42, p. 438.

3. Bhs., 8. 10. 355; Prajñāpanā Sūtra, Parīṇāmapada, 13; TS., p. 439.

4. Dravyatvamūrtatvasattvādayo anādyāpi pudgaladrave parīṇāmāḥ sentītyamūmarthaṁ viśiṇaṣṭī,
—TS. Tīkā, p. 439.

5. Davvao poggalatthikāe aṇaṁtāiṁ davvāiṁ, Bhs., 2. 10. 118; Aṇaṁtā khetṭādesenavi evaṁ ceva kālādesenavi bhāvādesenavi evaṁ—Ibid., 5. 8. 221.

Matter is equal to the extent of the Universe (lokapramāṇa) from the point of view of Kṣetra¹, i. e. it is co-extensive with the Universe, as it exists only in the space of the Universe (Loka). The forms of Matter occupy one point of space on-wards.² Ācārya Kundakunda explains this problem by stating that the Universe is densely filled with several varieties of infinitesimal infinite forms of Matter of subtle and gross nature in all directions.³ The auto-commentary of the Tattvārthā-dhigama Sūtra, while interpreting the Sūtra “Ekapradeśādiṣu bhājya pudgalānām” makes it clear that the accommodation (or immersion) of partless forms of Matter and forms of Matters having countable, countless and infinite parts (i. e. units of atoms) is in one point of space, that of binary compound or dyad (dvipradeśika or dvyaṇuka) is in one and two points of space, that of tertiary compound (tripradeśika) is in one, two and three points of space and so on up to those forms of Matter having countable, countless and infinite units of atoms are in countable, countless points of space of the Universe.⁴ Similarly, skandhas (molecules) formed of numerable, innumerable and infinite atoms are accommodated in one, countable and countless points of space of the Universe⁵ by their capacity of contraction of becoming subtle, just as the lights from several lamps intermingle.⁶

As to the point of nature that Matter is Jivagrāhya (receivable by Soul) it is explained in the Āgama that Matter is endowed with the attribute of reception or attraction from the

1. Khettao loyappamāṇamette.—Bhs. 2. 10. 118.
2. Ekapradeśādiṣu bhājyaḥ pudgalānām—TS. V. 14, p. 333.
3. Oghāḍhagāḍhanicido puggalakāyahehiṃ savvado logo suhumehiṃ bādarehiṃ ya aṇamṭāṇamṭehiṃ vivihehiṃ —Pañcāstikāyasāra, p. 70.
4. TS. Bhāṣya, V. 14, p. 333.
5. Sarvārthasiddhi, p. 279.
6. Avagāhanasvabhāvatvātsūkṣmapariṇāmācca mūrttimatām-apyavagāho na virudhyate ekāpavarake anekadīpaprakāśā-vasthānavat—Ibid., p. 279.

stand-point of quality.¹ On the basis of the āgamic statement Umāsvāti defines the point in this way that the individual self attracts particles of Matter which are fit to turn into karmapudgala (karmic matter) as the self is actuated by passions. This is bondage.² There is no capacity in Matter to attract Soul, but there is only the quality in it to be received by Soul. It is the Soul which receives Matter by attracting it and thus attains bondage with it. All souls do not receive matter. Only the worldly souls receive matter which is capable of turning into karmic matter because of the nature of being associated with the transformation tinged with passions. Just as the digestive fire of the stomach (gastric fluid or juice) absorbs food suitable to it, so also the self attracts karmas of duration and fruition corresponding to the virulent, mild or moderate nature of passions.³

Function of Matter

The function of Matter is to form the basis of body and organs of speech and mind, and respiration.⁴ That is, soul attracts further forms of Matter fit to turn into karmic matter by the association of forms of Matter like mind, speech, and body. In other words, Soul, having attracted forms of Matter and attained bondage with the received forms of Matter, transforms those forms of Matter into the form of mind, speech and body and again it attracts more forms of Matter fit to turn into karmic matter by the contact of matters transformed by mental, vocal and bodily activities. Forms of matter which are only capable of transformation into karmic matter are received or attracted by Soul,⁵ but all forms of Matter are not receivable to it.

1. Guṇao gahaṇaguṇe—Bhs., 2. 10. 118.

2. Sarvārthasiddhi, pp. 376-7.

3. Ibid., pp. 376-7

4. Śaṅkṛavāṅgmanahprāṇāpānāḥ pudgalānām—
TS., V. 19, p. 341.

5. Sakaṣāyatvājjiṣaḥ karmaṇo योग्याṇ pudgalānādatte
—TS., VIII. 2.

Matter in the form of paramāṇu (ultimate atom) cannot be attracted by Soul nor can it be received in all kinds of molecular conditions. Thus Matter, being transformed into the forms of body, speech, mind and respiration, comes in the service of Soul.¹

Similarly, the function of Matter is also to contribute to pleasure, suffering, life and death of living beings.² That is to say, forms of Matter render a service to the worldly souls by four means of upagraha (contributions), viz. pleasure, pain, life and death, having undergone transformation as body, speech, mind and respiration. "Owing to the presence of the internal causes of karma, which produce the feelings of delight and anguish, and in consequence of the ripening of external causes; such as objects, the disposition of agreeableness or affliction is pleasure or pain. The continuance of respiration in a being owing to the presence of the age-determining karma is called living (or life). The cutting off or destruction of respiration is death. Matter renders help to Soul in these respects, for these arise in the presence of material causes."³ All these modes like pleasure, pain, etc. in Soul are produced by Matter as material functions towards it. Souls and forms of matter exist in the Universe as being mutually bound, touched, immersed and tied to each other by attraction and getting mixed up like a jar and water or a sunken boat and water in a lake⁴ or intermingled with each other like milk and water.⁵ Of the general qualities of Matter, as conceived in the Nyāya-Vaiśeṣika system of thought impenetrability, perceptibility and mass of it (kāya) are essential aspects of its nature. Besides, it possesses colour, taste, smell, touch, priority, posteriority weight, fluidity, viscosity and impulse as the mūrta-guṇas (finite or subjective concrete

1. Sarvārthasiddhi, pp. 285-8.

2. Sukhaduḥkhajīvitamarāṇopagrahāśca—TS., V. 20, p. 343.

3. Sarvārthasiddhi, pp. 288-9.

4. Bhs., I. 6. 56.

5. Sanmatitarka, I. V. 47.

qualities)¹ and also elasticity (sthitisthāpakatva)². As it is substantial, it has the following objective qualities, viz. number, magnitude, separateness, conjunction and disjunction³. Colour, taste, smell and touch are respectively specific qualities (Viśeṣaḡuṇas) of the four material substances, viz. earth, water, fire and air and besides weight, fluidity, viscosity and elasticity are particular physical qualities of Matter, while number, magnitude, separateness, conjunction and disjunction and impulse are its general qualities (sāmānyaguṇas).⁴

It is to be noted that almost all the features of the nature of Jaina Pudgala (Matter) with the exception of its grahaṇaguṇa (capacity to be received by Soul) are found to be existing in Matter as conceived in the Nyāya-Vaiśeṣika school in one form or other.

Ancient Greek Conception of Matter

According to Compedodes and Aristotle, all matter is composed of one primordial substance called hyle or yelm⁵ which is identical in all bodies. The difference between various substances exist as a result of the presence of certain qualities in the varying quantities (or degrees) placed upon the Prime Matter by the four elements, viz. fire, earth, air and water. This conception of hyle or yelm (Primordial Matter and its elements) can be compared with Pudgala of Jaina metaphysics. The concept of the Primordial Substance founded on the theory of Aristotle continued for over than two thousand years. On the basis of it Alchemy, the forerunner of modern nuclear physics, aimed at transforming elements, particularly making metals

1. Rūparasagandhaśparśaparātṽparātṽgurutṽdravatvasnehavegā mūrtaḡuṇāḡ—PPBhā., Guṇapadārthanirūpaṇam, p. 38.

2. Nyāyakandalī, p. 272.

3. Saṃkhyāparīmāṇapṛthaktvasaṃyogavibhāḡā ubhayaguṇāḡ PPBhā.,—Guṇapadārthanirūpaṇam, p. 38.

4. Ibid.

5. Atoms and the Universe, pp. 126-149.

form the base ones. With a view to achieving this end the alchemists made attempts to obtain pure Prime Matter by separating the four elements from a substance. Their complete failure to achieve this objective, i. e. the accomplishment of the transformation of elements by adding four elements in the suitable proportions, brought to light the long neglected Greek atomic theory by the beginning of the nineteenth century mainly as a result of the research work of John Dalton.¹

In Western metaphysics Matter is conceived as one of the ultimate principles or substances; the physical world consists of material (substances) with qualities and relations.²

In this light Matter is a permanent reality and the substratum of such qualities which are constantly co-existent as a group in it. In the physical sciences it is the substance in the sense of 'Stuff' which constitutes the whole material universe. Extension, impenetrability, tangibility, mass, divisibility, porosity, compressibility, density and elasticity, etc. are the general or universal properties of Matter.³

Besides, it possesses colour, taste, etc. and the capacity of motion and the nature of dissociation and combination.⁴ The material universe consists of an almost infinite variety of material substances.

It is to be noted that like Jaina philosophy Western metaphysics and physics started with the conception of gross elements of Matter and gradually entered into the subtle atomic theory according to which all material substances are constituted of small units called atoms—the smallest fragment. Atoms means indivisible. But the definition of atom has been found absolute; later on, the physical sciences have demonstrated that atom is divisible.

Besides, the analysis of the nature of Matter as conceived:

1. Atomic Physics, p. 41.
2. Atoms and the Universe, p. 28.
3. Analysis of Matter, pp. 243-4.
4. Atoms and the Universe, pp. 126-149.

in Jaina metaphysics, in the light of physics, reveals that the features of the nature of Jaina Pudgala (Matter) are similar to those of Matter of the physical sciences to a considerable extent, though they differ on the point of *grahaṇaguṇa* (capacity to be received by Soul) of the former.

The above discussion on the concept of Matter in Jaina philosophy with a synthetic view of all other Indian concepts of Matter and that of Western metaphysics and physics shows how the problem was dealt with by the Jainācāryas in the absence of scientific verifying data of modern sciences about Matter which exists in space and continues in time with its static and dynamic forces in the cosmic Universe.

SECOND CHAPTER

ELEMENTS OF MATTER

According to Jaina philosophy, Pudgala represents the elements of Matter. Its effect is to offer resistance to causes which tend to produce a change in its position, configuration or motion. Ghātaśarīra (obstructive body) is a gross body which obstructs and is obstructed by other objects. A body which neither obstructs nor is obstructed by other objects is Aghātaśarīra (non-obstructive or fine body)¹. It can pass through any kind of Matter. That is to say, Ghātaśarīra which is the effect of Matter is impenetrable, while Aghātaśarīra is capable of passing through any kind of material substances, e.g. X-Ray. Rūpa of Buddhist philosophy also is impenetrable (sapratigha) like Ghātaśarīra of Jaina metaphysics.

Earth, water, fire, air, shadow, objects, four senses (indriyas) besides that of sight, sense-organs, physical mind, karmic matter and atom² (paramāṇu) constitute the whole material universe in the forms of molecules and atoms, as they are studied from the points of view of their grossest and finest constitutions. It is explained that "whatever is perceived by the senses, the sense-organs, the various kinds of bodies of beings, the physical

1. Bādarasuhumudayeṇa ya bādarasuhumā havānti taddhehā Ghādasarīraṁ thūlaṁ aghāda dehaṁ have suhumaṁ—
Gommaṭasāra, 183, (Jīvakāṇḍa), p. 114.

2. Puḍhavi-jala-chāyā-caurim̐diyavisaya-kamma-khaṁdh-e paramāṇu—Ṣaṭkhaṇḍāgama, Vol. III, p. 3.
Puḍhavi-jalaṁ-ca chāyā-caurim̐diya-visayakammapāoggā Kammātīdā yevaṁ chabbheyā poggalā hoṁti
—Pañcāstikāyasāra, 83, p. 81;
Puḍhavi-jalaṁ-ca chāyā-caurim̐diyavisayakammaparamāṇu Chavvihabheyāṁ bhaṇiyāṁ:poggaladavvaṁ Jīṇavarehiṁ
—GS. (Jīva), V. 602.

mind, karmans and are concrete objects—all these are Pudgala (Matter)”¹

There are stated to be six kinds of effects of Matter, viz. earth-embodiment (prthvikāya), water-embodiment (ap-kāya), fire-embodiment (tejakāya), air-embodiment (vāyukāya), plant-embodiment or vegetable-embodiment. (vanaspatikāya) and mobile beings' embodiment (trasakāya),² as they are inhabited by souls. They exist in the grossest, gross, gross-cum-fine, fine-cum-gross, fine and finest³ forms from the point of view of grossness and fineness, perceptibility and imperceptibility—tangibility and intangibility. That is to say, Matter (pudgalaskandha) whose chedana (cutting as under), bhedana (division) and prāpaṇa (portability) can be possible elsewhere is called the grossest form of Matter (bādara-bādara), e. g. earth, wood, stone, etc; that whose chedana and bhedana are not possible, but prāpaṇa is possible elsewhere is known to be the gross form of Matter or molecule (bādara pudgalaskandha), e. g. water, oil, etc. that whose chedana, bhedana and prāpaṇa cannot be possible elsewhere, but which is capable to be perceived by the eyes is called the gross-cum-fine form of Matter or molecule (bādarasūkṣma pudgalaskandha), e. g. shadow, heat, moonlight, etc.; that which is the object of the four senses of hearing, smell, touch and taste, respectively are the fine-cum-gross form of Matter. (Sūkṣmabādara-pudgalaskandha), e. g. sound, objects of odour, taste and touch; that which cannot be apprehended by the five senses is called fine form of Matter, e. g. dyad (dvyaṇuka); and that which is indivisible ultimate atom is the finest form of

1. Uvabhōjjaṃ imdiehiṃ ya imdiyakāyā maṇo ya kammāṇi
Jaṃ havadi mūttamannaṃ taṃ savvaṃ pudggaladavvaṃ
—PS., 82,
2. Bhs., 24, (12-16). 792-7; Pravacanasāra, II, 76;
GS., VV. 702-703, 704-707.
3. Bādarabādara bādara bādarasuhumaṃ ca suhumabāyaraṃ ca
Suhumaṃ ca suhumasuhumaṃ ca dharādiyaṃ hodi
chabbheyaṃ—GS.. (Jīva), V. 603.

Matter, e. g. dyad (dvyaṇuka); and that which is indivisible ultimate atom is the finest form of Matter (Sūkṣmasūkṣma). It is impenetrable, indivisible and incombustible¹.

The Physical world is thickly filled everywhere with the material bodies—gross or fine, capable of being received or not (by Soul). The material universe comprises an almost infinite varieties of material substances, it is the receptacle of living and non-living substances and is occupied by infinite atoms. The most important point is this that each of the effects of Matter, when analysed, is ultimately found to have been constituted of one or more of elementary practices.

Elements of Matter in Other Indian Systems of Thought :

Earth, water, fire, air and ākāśa (ether) as mentioned in the first chapter, have been accepted by all other Indian systems of thought² as the basic elements of Matter which constitute the material universe. On the basis of this postulation the thinkers of different Indian schools of thought began to speculate about them with the development of Indian philosophy.

The Sāṃkhya-Yoga View on Elements of Matter :

According to the Sāṃkhya-Yoga philosophy, the visible universe is unbound and of multifarious forms (viśvarūpa). It is divided into the grossest, grosser and gross, and fine, finer and finest constituents. Earth, water, fire, air and ether (ākāśa), their respective atoms (i. e. five kinds of atoms—earth-atom,

1. Bhs., 20. 5. 670.

2. Sāmaññaphalasutta, Dīg' anikāya, Ajitakeśakambalī's view; Sūtrakṛtāṅga, 1. 1. 17-18; Śvetāśvatara Upaniṣad, 1.2; Brhadāraṇyaka Upaniṣad, 2. 4. 12; Viśeṣāvaśyakabhāṣya, gāthā, 15531; Nyāyamañjarī, Vijayanagaram Series, p. 472; Tattvopaplavasīmha, p. 1; Tattvasaṃgrahapañjikā, p. 205; besides see Sūtrakṛtāṅga Nirukti, gāthā, 30 and Gaṇadhara-vāda, Gujarat Vidyāsabhā Prakāśana; the doubt of the third Gaṇadhara Vāyubhūti, p. 501; Majjhimanikāya II, Cūlamāluṅkiya Sutta for avyākṛtapraśna, etc.

etc.) and five kinds of infra-atomic potentials (tanmātras), viz. pṛthivī-tanmātra, ap-tanmātra, teja-tanmātra, vāyu-tanmātra and ākāśa-tanmātra, represent the elements of Matter, produced from Mass or Inertia of Prakṛti (Primordial Matter). So there are three stages in the constitution of Matter. (1) "The original infinitesimal units of Mass or Inertia, absolutely homogeneous and ubiquitous, on which Energy does work, when the original equilibrium comes to an end (Bhūtādi-tāmasā-haṅkāra), (2) the infra-atomic unit-potentials, charged with different kinds of Energy, which result from the action of Energy on the original units of Mass (tanmātra), and (3) the five minute divisions of which gross matter is capable (possible), but which are themselves complex tanmātric systems (sthūlabhūtaparamāṇu)."¹

The Nyāya-Vaiśeṣika View on Elements of Matter :

Like the Sāṃkhya-Yoga school the Nyāya-Vaiśeṣika philosophy also holds the view that earth, water, fire, air and ākāśa (ether)² basically represent the elements of Matter, but mind, time and relative position or direction³ are also admitted by this school of thought as non-basic substances. So they are classified into two divisions, viz. bhautika and abhautika (basic and non-basic) elements.⁴

Earth, water, fire, and air exist in the universe in two forms, viz. eternal as atoms (paramāṇus) and, non-eternal as effects (kāryadravyas).⁵ These effects were non-existent before their generation and will be non-existent after their destruction, but the four elements of Matter—earth, water, fire and air have a permanent form of existence as atom before their production

1. The Positive Sciences of the Ancient Hindus, p. 24.

2. PPBhā., p. 22.

3. Ibid.

4. Ibid.

5. The Conception of Matter According to Nyāya-Vaiśeṣika, p. 61.

and after their destruction.¹ According to the Vaiśeṣika doctrine of Intransitive Causation (*Ārambhavāda*), a new production of them takes place every time out of their permanent form.²

Ākāśa (ether)³, the last basic substance provides the auditory organ in common with other basic material substances. Its property-sound is manifested through this auditory sense-organ.⁴ It is also all-pervasive like other ubiquitous forms of Matter, time and relative position, making up a basic principle of creation.⁵ Mind among the non-basic substances is atomic in nature and is endowed with the characteristic of motion and velocity⁶ like the non-ubiquitous physical forms of Matter, having this difference that its motion is the fastest of all. Time and relative position⁷ are admitted as non-basic, ubiquitous substances at the base of the cosmic order in agreement with *ākāśa* (ether or space)⁸. Thus it is evidently clear that earth, water, fire and air as the effects of their respective causes—earth-atom, water-atom, fire-atom, and air-atom are non-eternal forms of Matter. They have intermediate dimension (*madhyama parimāṇa*)⁹, hence they are subject to destruction. Each of them is ultimately produced from its ultimate cause.

The Mīmāṃsā View on Elements of Matter :

The Mīmāṃsā philosophy has propounded the theory of the structure of elements of Matter in the main agreement with the Vaiśeṣika system of thought with regard to the cate-

1. The Conception of Matter According to Nyāya-Vaiśeṣika, p. 61.
2. Ibid.; PPBhā. p. 24.
3. PPBhā., p. 22.
4. Ibid.
5. Ibid.
6. Ibid., p. 21.; VS., V. II. 13.
7. PPBhā., p. 22.
8. Ibid.
9. The Conception of matter According to Nyāya-Vaiśeṣika, p. 62.

gories of five elements of Matter—earth, water, fire, air and ākāśa (ether) and their qualities like colour, taste, smell, touch, etc. Therefore, the concept of elements of Matter of the Mīmāṃsakas like Prabhākara and Kumārila Bhaṭṭa agree, in general, with the Vaiśeṣika concept of elements of Matter, etc.¹

Criticism of the Nyāya-Vaiśeṣika View on Elements of Matter :

According to the Nyāya-Vaiśeṣika school of thought, the advocate of many reals, the thought which used to give prominence to the external sensual experience gave main consideration to the aspect of qualities like colour, taste, smell, touch, substantiality, etc., possessed by earthly, aquatic, fiery and airy elements of creation. It accepted the postulation of cause and effect and the law of similarity. In order to have an explanation of the becoming effects in the form of gross elements of these qualities like colour, etc., from their cause, this philosophy has accepted the causes of these perceptible gross elements also as endowed with uniform or equal or similar qualities (samānaguṇas), and it went forward in search of cause—tradition. In the gross earthly objects the qualities which are experienced must be existing in their causes also, and the cause will certainly be finer than the effect. Having thought like this, the Nyāya-Vaiśeṣika finally came to this conclusion that the ultimate cause of earth is only earth and the basic elements of aquatic, fiery and airy creations also must be only of the categories of their respective realities. The material realities which are conceived by it in the form of these ultimate basic causes were accepted as atoms only. The fineness of the ultimate atom falls in the last category of division beyond which no further division of material elements takes place.

In this way the Nyāya-Vaiśeṣika has propounded the theory of production of the effect-world on the basis of mutually distinct infinite earthly, aquatic, fiery and airy ultimate atoms.

1. Prakaraṇapañcikā, p. 78 (pp. 52 ff.); Prabhākaramīmāṃsā, pp. 35 ff.

of various categories. Having accepted this principle "to whatever extent may the cause be fine, it gradually makes the beginning of the gross and grosser effects by conjunction of fine causes of the categories," the Nyāya-Vaiśeṣika has established the theory of Intransitive Causation (Ārambhavāda), i. e. one new dyad is produced by conjunction of two ultimate atoms, which, even being different from the two causative ultimate atoms, exists, inhering in them. Thus this system of thought made the constitution of gross production of the effects like hill, river, sun, etc. by this order that one triad is produced by conjunction of three dyads and one tetrad by conjunction of four triads.¹

The difference of this doctrine of Intransitive Causation of the Nyāya-Vaiśeṣika school of thought from the doctrine of change (Pariṇāmavāda) of the Sāṃkhya lies in the fact that the latter, having admitted the existence of all successive effects in the basic cause only, accepted the basic cause as existing in and through the effect even when the emergence of these effects is taking place by order. These effects which are going to be produced, do not come into the new existence by all means, but those which were existent in the cause as unmanifest become manifest on the attainment of favourable conditions of efficient cause, etc. But in the doctrine of Intransitive Causation all effects are different from the causes, and it is only accepted as such that new effects are produced a new. That is, infinite ultimate atoms of the four categories, having remained the same in their respective basic positions, begin to produce countless new effects on the strength of the materials out of themselves only.

In the doctrine of Intransitive Causation there is by all means the difference between effect and cause, while in the doctrine of transformation (Pariṇāmavāda) of the Sāṃkhya there is the prominence of non-difference between cause and effect. In the former the causes of the earthly effects are the

1. PPBhā., Sṛṣṭiprakaraṇa.

earthly ultimate atoms (e. g. earth-atoms) and those of the aquatic effects are the aquatic ultimate atoms (water-atoms). Infinite earth-atoms, even being of equal category as earth-atoms, are mutually very much related (vyāvṛta) and they preserve all the possible qualities which are inherent in earth-substance. According to the doctrine of Intransitive Causative, the four classes of infinite ultimate atoms, viz. earth-atoms, water-atoms, fire-atoms and air-atoms, have been accepted as the basic causes of the non-living (materials) universe and along with them, the eternal entities like ākāśa (ether), dik (relative position or direction) and kāla (time) also have found place in the non-living universe. Thus the Nyāya-Vaiśeṣika philosophy accepts many realities on the basis of causes.¹

The Buddhist View on Elements of Matter :

According to the Vaibhāṣika school, Rūpaskandha (Matter) represents the following fifteen kinds of Dharmāyatana (bases of cognition), viz. (1) cakṣurindriya (sense of vision), (2) rasanendriya (sense of taste), (3) śravaṇendriya (sense of audition), (4) ghrāṇendriya (sense of smell) and (5) tagendriya (sense of touch), (6) rūpa (colour and shape), (7) rase (taste), (8) śabda (sound), (9) gandha (odour) and (10) spraṣṭavya (tangible), i. e. five kinds of sense-objects, and five kinds of avijñapti (unmanifested matter). In all there are stated to be fifteen kinds of Rūpaskandha (Matter).² In the Jaina tradition also rūpa (colour) is prominent among the four inherent qualities of Matter, as is evidenced by the fact of its definition "Rūpiṇaḥ pudgalāḥ" (Matters are corporeal).³

The Visuddhimagga of Buddhaghosa maintains that there are stated to twenty four kinds of derived Matter (upādāya-

1. Bhāratīyātattvavidyā, Pandit Sukhlalji, pp. 58-60.

2. Rūpaṃ pañcendriyāṇyarthāḥ pañcāvijñaptireva ca

Tadvijñānāśrayā rūpaprāsādāścacakṣurādayaḥ

—Abh. K., 1. 9.

3. TS., V. 4.

rūpa), viz. cakkhu (eye), sota (ear), ghāṇa (nose), jihvā (tongue), kāya (body), rūpa (colour and shape), sabda (sound), gaṇḍha (smell), rasa (taste), itthindriya (material quality of female sex), purisindriya (material quality of male sex), jīvitendriya (life and matter), hadaya-vatthu (heart), kāyaviññatti (intimation by body), vacīviññatti (intimation by speech), ākāśadhātu (elements of space-vacuum), rūpassa lahutā (lightness of matter), rūpassa madutā (pliancy of matter), rūpassa kammaññatā (adaptability of matter), rūpassa upacaya (integration of matter), rūpassa santati (continuance of matter), rūpassa, jaratā (decay of matter), rūpassa aniccata (impermanence of matter) and kabalikāro āhāro (edible food).¹

According to the Theravāda school, all these twenty four derived forms of Matter are dharmas (elements), therefore, they should be admitted as ultimate elements. But many of them can be considered "rather as aspects, modes or qualities than separate entities. This is borne out by the commentarial description of some of these dharmas and a distinction drawn between nipphana and anipphana rūpa"². As for example, ākāśa-dhātu (element of space-vacuum) is described as pariccheda-rūpa (material quality of relative limitation), kāyaviññatti and vacīviññatti (intimation by body and speech), together with lahutā, madutā and kammaññatā (lightness, pliancy and adaptability of matter) are stated to be vikārarūpas (material qualities denoting special conditions). The upacaya, santati, jaratā and aniccata (integration, continuance, decay and impermanence of matter) are known as lakṣaṇarūpa (characteristics of matter). These ten kinds of rūpa are stated to be anipphanna-rūpa in order to point out their difference

1. Visuddhimagga, 14. 36, p. 309.

Of these only twenty three are mentioned in Dharmasaṅgavī. The hadaya-vatthu has later been added by the commentators to the list. See Dhṣ., A. IV, 112.

2. Abhidharmadīpa, Introduction, p. 91, They are termed also as parinipphanna and aparinipphanna in Dhṣ., A. IV, 119.

from the remaining fourteen of the twenty four derived forms of Matter, which are described as nipphanna-rūpa.

According to Buddhaghōṣa, nipphanna-rūpas are "those which transcend limits, change and characteristics and which are to be seized in their intrinsic nature (svabhāva)¹, while anipphanna-rūpas are opposite in nature to them.² Nipphanna-rūpas are endowed with their own nature, whereas anipphanna-rūpas are not possessed of their own nature and are known only by relating them to svabhāva-rūpas,³ Their mention in the Abhidharma indicates an influence of the Vaiśeṣika philosophy, advocating the doctrine of Dravya (substance) and guṇa (quality). This was known to the Buddhist commentators, as is evidenced from the criticism of Buddhaghōṣa that rūpa and gandha (colour and smell) are the qualities of teja (fire) and pṛthivi (earth) respectively.⁴

Some of nipphanna rūpas can also be posited in the group of anipphanna rūpas, e. g. jīvitendriya is not composed of a separate matter (rūpa), but only a name attributed to the life of matter; tthindriya and purisindriya, two material qualities of sex can be considered as different aspects of kāya (body); kabalikāro aharo (edible food) is nothing but a name attributed to the material quality of nutrition.⁵

Like the Visuddhimagga, the Abhidharmāmṛtaśāstra of Goṣaka provides a similar list of Rūpaskandha as noted below :

1. Abhidharmadīpa, Introduction, p. 91.
2. Paricchedavikāralakkhaṇabhāvaṃ atikkamitvā sabhāvena pariggahetabbato nipphannaṃ, sesaṃ tabbiparītatayā anipphannaṃ — VM., 14. 73.
3. VM., Tī, pp. 457-8.
4. Kaci panettha, tejādīnaṃ guṇehi rūpādīhi anugayahabhāvato ti kāraṇaṃ vadanti te vatrabbā ko panevamāha; rūpādayo tejādīnaṃ guṇā ti ? avinibbhogavuttisu hi bhūtesu, ayaṃ imassa guṇo, ayaṃ imassa guṇo ti na labbhā vattuṃ ti — VM., XIV, 43, p. 310.
5. Abhidharmadīpa, Introduction, p. 92.

Rūpas=Twelve : Five prasāda rūpas(sensitive qualities) : Cakṣu (eye), śrotra (ear), ghrāṇa (nose), jihvā (tongue), kāya (body); seven viśaya rūpas : rūpa (colour), śabda (sound), gandha (smell) and rasa (taste); three kinds of spraṣṭavya (=touch or contact), i. e. tangible, tejodhātu spraṣṭavya (contact of fire or fire-tangible), and vāyudhātu spraṣṭavya (contact of air or air-tangible).

SIXTEEN SŪKṢMA RŪPAS

(Subtle forms of Matter)

Of them ten are anispanna rūpas (1-10), namely, (1) paricchedarūpa (=material quality of relative limitation), (2-3) vijñaptirūpas (=material quality of expression) : kāyavijñapti (bodily expression), vāgvijñapti (vocal expression), (4-6) vikāra-rūpas (=conditions of matter) : laghutā (=lightness), mṛdutā (=pliancy), karmajñatā (adaptability), (7-10) lakṣaṇarūpas (=essential characteristics of material quality) : upacaya upacaya (=growth), santati (=continuity), jarā (=oldness), anityatā (=impermanence or death), (11-12) bhāvarūpas (=material qualities of sex) : strīṭva (female), puruṣatva (male). (13) hṛdayavastu (=heart, the seat of consciousness), (14) jīvitendriya (=vital force), (15) āhāra (=food). (16) apodhātu (=water); it is not included in the spraṣṭavya (tangible or contact).¹

Of the twenty four derived forms of Matter (upādāya rūpas) as mentioned in the Visuddhimagga only nine—the five sense-organs and four sense-objects, phoṭṭhabba (tangible), being incorporated in Mahābhūtas (fundamental material elements) can be regarded as dharmas (elements) possessing intrinsic nature (svabhāva) and hence real.² It is to be noted that these ten

1. Abhidharmamṛtaśāstra of Ghoṣaka, ed. by Śānti Bhikṣu, p. 12.

2. According to the Sautrāntikas, four Mahābhūtas and four sense-objects are rūpa-dharmas.

See Ālambanaparīkṣā, Appendix D, p. 116.

rūpa—dharma are in fact the ten of the eleven dharmas as embodied in both the Vaibhāṣika-Yogācāra list of rūpadharmas, i. e. five sense-organs—eye, ear, nose, tongue and body, and five sense-objects—colour, sound, smell, taste and touch or contact;¹ and avijñapti (unmanifested form of Matter).² Avijñapti of the Vaibhāṣikas has been incorporated by the Yogācārins in their eleventh category of rūpa called dharmadhātu paryāpanna (matter included in dharmadhātu).³ Avijñapti has not been accepted by the Sthaviraj; instead, sūkṣmarūpa (subtle form of Matter) has been admitted by them.⁴ In this sūkṣmarūpa many dharmas (elements) are included, such as; jarā (old age or decay), anityatā (impermanence), etc., which have been incorporated by Ghoṣaka, Vasubandhu and Asaṅga into Citta-viprayukta saṃskāras (i. e. composite energies apart from matter and mind).⁵

Bhadanta Ghoṣaka defines Avijñapti in this way : “Avijñapti arises either in a kuśala citta (good mind) or in a akuśala citta (bad mind), but not in a avyākṛta citta (neutral mind), because avyākṛta citta is very feeble in nature.”⁶ This simple definition of Avijñapti given by Ghoṣaka is similar to that given by Vasubandhu in the Abhidharmakośa—

Vikṣiptācittakasyāpi yo anubandhaḥ śubhāśubhaḥ
Mahābhūtānyupādāya sā hyavijñaptirucyate.⁷

“Perhaps Vasubandhu was conscious of this; that is why he also like Ghoṣaka has given a simple definition in his commen-

1. Abhidharmāmṛtaśāstra of Ghoṣaka, p. 13.

2. Abhidharmāmṛtaśāstra, p. 13.

3. A Manual of Buddhist Philosophy, pp. 130 ff.;
see also Abhidharmāmṛtaśāstra of Ghoṣaka, p. 11.

4. Sukhumarūpaṃ—Abhidharmmattho Saṃgraha, VI. 8.

5. Abhidharmāmṛtaśāstra of Ghoṣaka, p. 11.

6. Kuśalākuśalacittajaṃ bhavatyavijñaptirūpaṃ na tvavyākṛtacittam, tat kasya hetoḥ avyākṛtacittasyātidurbalatvāt (418), Vide Abhidharmāmṛtaśāstra, p. 11.

7. Abh. K., I. 11.

tary on Kośa (1.11) which runs as follows” :

“Vijñaptisamadhisaṃbhūtaṃ kuśalākuśalarūpamavijñaptiḥ”

The sphuṭārthā (commentary) of the Abhidharmakośa makes the point clear by stating that “the Ācārya has defined avijñaptirūpa in brief word to make it easily intelligible to the students”.¹

Analysis of Elements of Matter as conceived in the Buddhist Philosophy :

According the Vaibhāṣika doctrine, dharmas (elements) capable to be apprehended by the sense of sight have been defined as Rūpa, just as in the Vaiśeṣika philosophy only the qualities like blue, yellow, etc. have been called rūpa, but the Vaibhāṣika school maintains that only colour has not been called rūpa just like that in its doctrine. Its view is that colours like blue, yellow, etc., and the shapes like shortness, length, etc., also have been called rūpa.²

In the Vaiśeṣika philosophy colour or dimension is not a substantial entity but inherent in the material substance and attributive in nature, but according to Vaibhāṣika school, they have not been admitted as such. Each of them has been accepted as separate entity. In Jaina metaphysics the qualities, such as, colour, etc. are admitted as inherent in the material substance and at the same time they are identical with and different from it.

Blue, red, yellow and white are the four kinds of colour. Cloud (abhra), smoke (dhūnra), dust (rajas), mist or vapour (mihika), shadow (chāyā), heat (ātapa), light (āloka) and darkness (tamaḥ) are the eight kinds of secondary (apradhāna) colour; length, shortness, roundness (or circle), spherical, high, low, even and uneven are the eight kinds of shape. In the Vaibhāṣika school these twenty kinds of element as a while are

1. Śiṣyasukhāvabodhārtham saṃkṣepato vākyena tadavijñaptirūpaṃ darśayatyācāryaḥ—Abh.K., 1.11, Sphuṭārthā.
2. That is, paramāṇus of the Vaiśeṣika also have been called rūpa by the Vaibhāṣikas.

defined as rūpa.¹

There are stated to be three divisions among these twenty kinds of rūpa under the category of varṇa (colour) and saṁsthāna (shape). The first division, i. e. colours, such as, blue, etc., is only varṇātmaka (associated with colour); the third division, i. e. shapes like length, etc., is only saṁsthānātmaka (associated with shape) and the second division is constituted of colour and shape together (varṇa and saṁsthāna). Here the question arises what is the necessity of mentioning the second division, as its place has been covered by the first and third divisions. In the cloud, etc. there is the assemblage of blue colour and the shapes like long, etc., so they will be included in the blue colour and shapes like long, etc. In reply to this question the Vaibhāṣikas explain that the shapes like long, etc., belonging to the third division are kāyavijñapti dharma (bodily expression or physical intimation), i. e. they are a kind of activity (kriyā) of Kāyika saṁsthānaviśeṣātmaka (particular physical shape).² They are formed in the shape of length, etc. If a person goes on foot to some distance, the physical activity is considered as long; thus if he moves in circle, his activity (kriyā) is understood as round. So the physical action also, in fact, becomes of particular shapes like long, etc.

In the Vaibhāṣika school the actions like going, etc. have been called 'Kāyavijñapti' (physical intimation).³ The Vaibhāṣika view of action must completely be distinct from the Vaiśeṣika concept of action, for it has admitted the substance—substratum of action, as separate and permanent. So it has been possible to accept a separate entity called action (karma) in this system of thought by recognizing a separate substratum

1. Rūpam dvividhā vimśatidhā—Abh. K., I. 10.

2. Kāyavijñaptisvabhāva iti. Kāyavijñaptirhi kadācit dīrghā kadācid—hrasvā kadācid—yāvadiśāteti. kīdṛṣī punaḥ sā avagantavyā; tadālambanacittasamutthāpitam yat kāya-karma—Abh. K., I. 10 Sphuṭārthā.

3. Ibid.

and its permanence. It is to be noted that karma (action) of the Vaiśeṣika school of thought corresponds to paryāya (mode) of Jaina metaphysics.

According to the Vaibhāṣika school, Dharma (element) possessing the nature of momentary change has been accepted as momentary and a separate substantial entity has not been admitted as the substratum of action. Therefore, it is held that the existing (i. e. apparent) shapes like long, etc., have been called *kriyā* (action or activity) popularly. There cannot be a separate *kriyā* (action), although Dharmas are changing at every moment (*pratikṣaṇa-parināmin*).

These *Kāyavijñaptirūpa-saṁsthānas* (physical intimation-like shapes), such as, long, etc., are apprehended by the eye without the perception of colour (*rūpadarśina*)¹. One man perceives another one walking on road as long; there does not exist any apprehension of colour with that perception, i. e. perception of colour as co-existing with shape. That is to say, some one perceives even the body of a person as long and when he goes on some particular path, then that *kriyā* (going) is regarded as long. In the apprehension of physical length at the first sight there is the perception of colours, such as, blue, etc., as co-existing with it. So one perceives the colour of the body and its length simultaneously. But when one regards the going of that person as long, there does not remain the perception of any colour associated with that going. As these shapes are of the nature of *Kāyavijñapti* (physical intimation), so in order to explain them separately, the shapes, such as, long (or length), etc., have been defined in the third division. In order to inform that there are the shapes like long, etc., besides *vijñaptisvabhāva* (nature of intimation), cloud, smoke, dust

1. *Vaibhāṣikāṇāmaya-mabhiprāyaḥ nīlādigrahaṇamātāpālō-kagrahaṇam vā saṁsthānanirapekṣam pravarttate; kāyavijñaptigrahaṇantu varṇanirapekṣam pariśiṣṭarūpāyatana-grahaṇantu varṇasaṁsthānapekṣam pravarttate—*

Abh. K., I. 10 *Sphuṭārthā*.

and mist have separately been accepted in the second division. But the shapes of these objects are not at all of the nature of vijñapti (intimation). One does not comprehend these shapes as kriyā (action or intimation). Moreover, when one perceives their shapes like long, etc., then there must be the perception of any colour associated with them. That is, in that case there is produced a perceptual cognition of the two kinds of base (āyatana), viz. colour and shape (varṇa and saṁsthāna). If it is conceived that two cognitions are produced simultaneously but separately on various supports, it will be contrary to the postulation, for, according to the Vaibhāṣika views, the birth of two cognitions (Vijñānas) simultaneously is not admitted.¹ With a view to explaining separately the aforesaid shapes of the objects of perception conditional upon colour, i. e. there are the shapes like long, etc., of another kind which are different from the shapes of Vijñaptisvabhāva, cloud, vapour, etc. have been mentioned separately in the second division. Mention of ātapa (sunshine) and āloka (moonlight) is made in this division, hence it is stated that varṇātmaka rūpas (forms of matter associated with colour) also come across in particular case as saṁsthāna darśananirapekṣa (independent of perception of shape). In this case the warm sunshine and the cool moonlight have been denoted by the words 'ātapa' and 'āloka'² respectively.

In ātapa and āloka, which are perceived, only colour becomes their ālambana (support). But any kind of shape, such as, long, etc., does not become their ālambana. In all these cases colour is perceived without having any shape. Elsewhere shape becomes supported in the awareness (or intimation) of

1. Samanantarapratyayo hi tadānīm cittacaittalakṣaṇaḥ ekasyaiva tasya nīlavijñānasya utpattau avakāśaṁ dadāti-netareṣāṁ nīlāntarādi vijñānānām yugapadvijñānotpattya-sambhavāt—Abh., K., 1. 6, Sphuṭārthā.

2. Ātapaḥ uṣṇaprakāśa sūryasya, ālokaḥ śītaprakāśa indroḥ—Abh., K., 1. 10, Rāhulakṛtavyākhyā.

colour. Of course, colour which is perceived in a picture is found to be endowed with shape, i. e. in all those cases each and every cognition exists having a support on both colour and shape.

As there is the variety of exhibited rūpas in colour and shape-consciousness (or intimation), twenty kinds of rūpa have been shown by dividing it into three groups in the Vaibhāsika texts. Dharmas (elements) which are known as earth, water, fire and air, in the worldly sense, will be included in the list of the aforesaid rūpa, for these elements also are just like the aggregate of ultimate atoms, having colour and shape. As in earth, there are also colour and shape in water and fire. Therefore, there are also the aggregate of colour and shape-atoms like earth. As no colour nor any shape of air can be perceived, so the question is whether the air-element belongs to rūpa or not. If not, then it will be outside the category of pañcaskandha. If it is, then it has been divided as skandha of Saṃskṛtadharma (aggregate of non-eternal elements); this view will be affected by the fault of deficiency (nyūnatādoṣa). Rāhul Sānskrityāyana, while explaining this question in his Vṛttigrantha says that air also belongs to rūpa (matter), for black colour and circular shape of air can be perceived.¹ Yaśomitra has not said anything clearly about the colour of air. But the physical sciences have demonstrated that air has got fluish colour, if it is cooled down. Jaina philosophy also admits the colour of air like the physical sciences.

Earth is hard (of the nature of hardness or repulsion), water is cohesive (of the nature of attraction, i. e. the producer of lumpness of ground things), fire is of the nature of heat and air is motive (of the nature of motion)². Earth is repulsive (sandhāraka) because of being of the nature of hardness, water

1. Vāyudhāturapi pṛthivyādivatvarṇasaṃsthāna rūpaḥ, ata eva loke kṛṣṇo vāyuḥ, cakrarūpovāyuriti vyavahāraḥ
—Abh. K., I.3, Rāhulakṛtavyākhyā.

2. Bhūtāni pṛthivīdhāturatejo vāyu-dhātavaḥ
—Abh. K., I.12.

is attractive because of its nature of cohesiveness, fire is cooker or warm because of its heat, and air is motive because of its nature of motion.¹

These four elements are defined in the Vaibhāṣika texts as Dhātu (element) and Mahābhūta (fundamental or general elements of Matter). Now, it is clearly understood that according to the Vaibhāṣika school, 'rūpa' signifies colours, such as, blue, yellow, etc. and shapes, such as, short, long, etc. In the Vaibhāṣika work these parimāṇas (dimensions) have been explained by the name of saṁsthāna (shape), just as it is found in the Jaina works. Dharmas (element) which are known as earth, water, fire and are accepted as Rūpa (Matter) according to the said view because of colour and shape of these Dharmas on the basis of the above analysis of them.

In the Vaibhāṣika texts the objects having colour and shape have again been known by the appellation of Dhātu and Mahābhūta. The contention of this fact is this that as colour and shape, the same definition of earth, water, etc., are known by one term, Rūpa', because every one of them is Dharma having colour and shape. In order to explain them separately in the text pṛthivīdhātu, jaladhātu, tejodhātū and vāyudhātu (earth, water, fire and air) have been dealt with by such dhātvantasamjñās (terminologies). They do not call to mind the meaning in the sense of colour and shape. On the other hand, hardness, etc. point separately to the list of ten objects having colour and shape.²

The word 'Pṛthivīdhātu' denotes only hard natured colours and shapes, cohesive (attractive) colour and shape are not

1. Dhṛtyādikarmasāmsiddhāḥ kharasnehoṣṇateranāḥ
—Abh. K., 1.12.

2. Pṛthivīdhāturatejavāyudhātavaḥ—Abh. K., 1.12;
Dhātugrahaṇam varṇa saṁsthānātmakapṛthivyādinirāsā-
rthaṁ svalakṣaṇopādāyarūpadhāraṇādvā dhātava iti, kāṭhi-
nyādisvabhāvalakṣaṇam cakṣurādyupādāyasvarūpām ca da-
dhātīti dhātavaḥ — Ibid., Sphuṭārthā.

signified by it. The word 'Jaladhātu' or 'Ap-dhātu' brings up cohesive colour and shape; it does not signify hard natured colour and shape. The word 'Tejodhātu' denotes only heat-natured colour and shape; it does not bring forth colour and shape of any other nature. The word 'Vāyu-dhātu' denotes only motive colour and shape; it does not mean colour and shape of any other nature. In order to comprehend the characteristics like hardness, etc. which are possessed by the aforesaid elements endowed with colour and shape, these elements have been designated by the different terms like pṛthivī-dhātu, etc., for the natures, such as repulsion, etc., are produced by them. For this reason they may have been called 'Bhūta'. Their constitution is very great, that is why they have been called Mahābhūta (fundamental or general element).¹

It is known that other entities are contained in earth. Ground things like śaktu (wheat powder), etc. become lump with the mixing of water in them. This cohesive quality (or tendency) is produced by water in them. For this reason water has been called 'Bhūta'. It is perceived that the cooking of foodstuffs is caused by fire, the raw mango ripens as a result of heat from the sunshine; the eaten food-stuff and liquid things drunk by some one (pītavastu) are cooked and digested by the fire of the stomach. This cooking function is performed by fire, so it is called 'Bhūta'. It is known that other things are moved or increased by the assistance of air.

If air blows in speed, the branches of leaves of the trees move to and fro; human body grows by vital air. This motion or activity of motion (prasarpaṇa or vyūhanavṛtti)² is caused by air. For this reason it is called 'Bhūta' in the Vaibhāṣika

1. Tairmahābhūtairudbhūtā vyaktāvṛttiḥ dhṛtyādikāyeṣu te ime tadudbhūtavṛttayaḥ pṛthivyaptejo vāyuskandhāḥ, eṣāṁ mahābhūtānāṁ mahāsanniveśatvāt mahārācanatvāt bhūtāṁ tanvantīti bhūtāni—Abh. K., 1, 12, Sphuṭārthā.

2. Vyūhanāṁ punarvṛddhiḥ prasarpaṇam veti
—Abh. K. 1, 12, Sphuṭārthā.

text. The elements which are the producers of various *vṛttis* (activities) are called *Mahābhūtas* for their vastness. Thus *Dharma* (element) having one and the same colour and shape has been called *Rūpa*, *Dhātu*, *Bhūta*, and *Mahābhūta* by name from different points of view.

In the empirical world none of the various elements which are regarded as elements like water, etc. is the aggregate of *Dhātus* of one and the same category. As for example, an earth element as an aggregate of any particular earth-atoms would not be perceived in the empirical world. If an atom is taken as an example of earth-elements, then it is found in an analysis that there is an admixture of water, fire and air elements in it. It would be called earth because of there being a capacity of it to contain other elements in it. In that case, having been there combined earth-atoms, it must be admitted that there is a mixture of water-atoms in it. As a result of chemical action (*pāka*) it has been transformed into the state of stone, so there is also a mixture of fire-atoms in it. As it is increasing (in volume), so it must be admitted that there is a mixture of air-atoms in it. By this order it should be understood that there is a combination of other elements in the elements like water, etc.¹

Besides the five sense-data (*indriyaviṣaya*), constituting external objects, the five sense-organs (*indriyas*) possessing colour and shape have been included in the list of *Rūpa* (Matter) and have been conceived as *rūpaprāsāda* (translucent matter of sense-organs), which covers the body when it is living. They are the substratum of visual consciousness, etc.

According to Professor Stcherbatsky, this division of Matter (*Rūpa*) into objective sense-data and sense-organs is similar to the *Sāṃkhya* development of Matter along two lines, "the one with the predominance of the translucent

1. *Upalādikē hi pṛthivīdravye saṃgrahapañktivyūhanadārśanāccheṣānām jalatejovāyūnāmastitvamanumīyate*
—Abh. K., I. 17, *Sputārthā*.

intelligence stuff (sattva) resulting in sense-organs, the other with the predominance of dead matter (tamas) resulting in sense-objects in their subtle (tanmātra) and gross (mahābhūta) forms. In fact, the concept of tanmātra comes very near to the Buddhist conception of elements of matter (rūpadharma). The fundamental difference between the two conceptions is that in the Sāṃkhya system these elements are modification or appurtenances of an eternal substance. In Buddhism they are mere sense-data without any substance.¹

The Vedāntist View on Elements of Matter

The Vedāntist view on the elements of Matter is almost similar to that of the Sāṃkhya-Yoga system of thought. The only fundamental difference is this that Māyā¹ (illusion) is admitted as the material cause of the Universe in place of Prakṛti of the Sāṃkhya-Yoga. Besides, Matter is regarded without having atomicity² of structure. According to the Vedānta, the five Mahābhūtas (gross elements of Matter), viz. earth, water, fire, air and ether, and their five sūkṣmabhūtas (subtle forms of matter) represent the elements of Matter. The gross earth-matter is constituted of four parts of subtle earth-matter and one part of each of other forms of subtle matter. Similarly, it is the principle with other gross forms of Matter, viz. water, fire, air and ether (ākāśa) in regard to their respective constitution.

The following table represents the constitution of gross Matter (Mahābhūta), if āk, v, t, ap and kṣ stand for the five forms of subtle matter (ether, air, fire, water and earth) and ĀK, V, T, Ap and Kṣ for the corresponding five forms of gross Matter :—

$\bar{A}k = \bar{a}k^4 (v_1 t_1 ap_1 kṣ_1)$, ak^4 being the radicle.

$V = v^4 (\bar{a}k_1 t_1 ap_1 kṣ_1)$, v^4 being the radicle.

$T = t^4 (\bar{a}k_1 v_1 ap_1 kṣ_1)$, t^4 being the radicle.

1. The Central Conception of Buddhism, p. 10.
2. Brahmasūtra, I. 1, Śāṅkarabhāṣya; Pañcadaśī I.
3. Brahmasūtra, II 2.11., Śāṅkarabhāṣya; Pañcadaśī I.

$Ap = ap^4 (\bar{a}k_1 v_1 t_1 k\bar{s}_1)$, ap^4 being the radicle.

$K\bar{s} = k\bar{s}^4 (\bar{a}k_1 v_1 t_1 ap_1)$, $k\bar{s}^4$ being the radicle.

The potential energies become actualized in the forms of gross forms of Matter in this way that "The Mahābhūta Ākāśa manifests sound, vāyu, sound and mechanical energy; Teja,—sound, mechanical energy and heat-light, Ap—the energy of taste - stimulus in addition and finally Kṣiti - Earth,—the energy of the smell stimulus added to the foregoing.¹

"The Sūkṣma Bhūtas are forms of homogeneous and continuous matter, without any atomicity of structure; the Mahābhūtas are composite; but even these are regarded as continuous, and without any atomic structure. The Vedānta speaks of Anu not as ultimate indivisible discrete constituent of matter; but as the smallest conceivable quantum or measure. Here this philosophy differs from the Sāṃkhya doctrine of the atomic structure of Matter."² But the philosophy of Mādhva³, the only Vedāntist, supports the atomic growth of Matter by accepting the aforesaid five elements. Jaina metaphysics basically disagrees from the Vedānta on this point of its doctrine of the atomic structure of Matter and the formation of its elements, although this philosophy accepts the four elements - earth, water, fire, and air in common with the Vedānta.

Earth, water, fire and air⁴ have been accepted by all other

1. The Positive Science of the Ancient Hindus, p. 87.
2. Ibid., p. 88.
3. Pūrṇaprajñādarśana.
4. Sāmaññaphalasutta, Dīghanikāya, Ajitakeśakambalī's view; Sūtrakṛtāṅga, 1. 1. 17-18; Śvetāśvatara Upaniṣad, 1. 2; Brhadāraṇyaka Upaniṣad, 2. 4. 12; Viśeṣāvaśyakabhāṣya, gāthā, 15531; Nyāyamañjarī, Vijayanagara Series, p. 472 Tattvopaplavasiṃha, p. 1.; Tattvasaṃgrahapañjikā, p. 205; Sūtrakṛtāṅga Nirukti, gāthā 30.; Gaṇadharavāda, Gujarat Vidyāsāphā Prakāśana, the doubt of the third Gaṇadhara, Vāyubhūti, p. 501; Majjhimanikāya, II, Cūlamālunkiyasutta of avyākṛtaprasāna, etc.

Indian systems of thought as the basic elements which constitute the material universe, so there appears to be a close relationship of the structure of elements of Matter of Jaina metaphysics with those of other Indian schools of thought.

The Jaina concept of Pudgala (Matter), when compared with that of hyle or ylem¹ of Greek philosophy shows that originally the name 'elementary particle' was applied to the four elements only - fire, earth, air and water. The Jaina conception of elements of Matter appears to be unique in its originality, for it has given place to Indriyas (senses)², Karmic matter³ and Leśyā (condition of soul)⁴ also as the material elements in its fold on the basis of the psycho-physical aspects of the material universe. A study of the order of the elements of Matter reveals that Jaina metaphysics commenced with the conception of the grossest forms of Matter and went deep into that of its finest form—the subtle force by stages in dealing with the problem like general metaphysics and physics of the West.

According to the modern physical sciences, there are stated to be one hundred three elements of Matter. There are as follows ; hydrogen, helium, lithium, beryllium, boron, carbon, nitrogen, oxygen, fluorine, neon, sodium, magnesium, aluminium, silicon, phosphorus, sulphur, chlorine, argon, potassium, calcium, scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, gallium, germanium, arsenic, selenium, bromine, krypton, rubidium, strontium, yttrium, zirconium, niobium, molybdenum, technetium, ruthenium, rhodium, palladium, silver, cadmium, indium, tin, antimony, tellu-

1. A History of Greek Philosophy, W. K. Guthrie, Vol. III, p. 141.
2. Bhs., 1.7.61; TS., II. 15.
3. Śaṭkhaṇḍāgama, Vol. III, p. 3.
Pañcāstikāyasāra, 83;
Gommaṭasāra (Jīva); 602. Bhs., 1. 2. 22.
4. Pañcāstikāyasāra, 89.

rium, iodine, xenon, caesium, barium, lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutecium, hafnium, tantalum, wolfram, rhenium, osmium, iridium, platinum, gold, mercury, thallium, lead, bismuth, polonium, astatine, radon, francium, radium, actinium, thorium, protactinium, uranium, neptunium, plutonium, americium, curium, berkelium, californium, einsteinium, fermium, mendelevium, nobelium and lawrencium.¹

It is noteworthy that the Jaina literature mentions a number of basic elements of Matter some of which are common to both the physical sciences and Jaina chemistry, e. g. silicon, sulphur, iron, zinc, copper, tin, lead, silver, gold, mercury,² etc. It shows that like the alchemists of the middle ages the Jainācāryas also conceived the idea of pure elements of Matter as distinguished from its base forms on the basis of the knowledge of their experimental study of making gold, silver, etc.³ with their keen insight in the womb of Nature even in the absence of developed experimental science of modern age.



1. General Chemistry, Pauling.

2. Suvarṇa-Raupya-Siddhi-Śāstra, Jinadattasūri (VS. 1210).

3. Ibid.

THIRD CHAPTER INDRIYAS, KARMA AND LEŚYĀ

FIRST SECTION INDRIYAS (Sense-Organs)

Indriyas have been studied in Indian philosophy from the points of view of etymology of the word 'Indriya', cause of indriyas, their place, their number, their object, their shape, their mutual identity and difference, their kinds and distinction of apprehensibility of substance-quality dravyagūṇagrahitvaviveka, etc. The earliest reference to its etymology is come across in the Pāṇini Sūtra.¹ The same etymology of the word 'Indriya' found its way in the early Buddhist and Jaina texts like *Visuddhimagga*² and *Tattvārthādhigama Sūtra*'s *Bhāṣya*³ respectively. Besides, it is also recorded in the Jaina āgama *Bhagavati Vyākhyāprajñapti*.⁴

In the history of the etymology of the word 'Indriya' there are mainly two things to be noted—the one is that the Buddhist grammarian and Pāṇini's commentator have given place to that

1. Indriyamindraliṅgamindrādṛṣṭamindrāsṛṣṭamindrajusṭamin-dradattamiti vā—Pāṇini, 5. 2. 93.
2. VM.XVI Indriyasaccaniddesa, 4, 5, 6, Vide Darśana and Cintana, p. 134.
3. Pañcendriyāṇi bhavanti; ārambho niyamārthaḥ ṣaḍādipra-tiṣedhārthaśca; indriyamindraliṅgamindrādṛṣṭamindrajusṭa-min-dradattamiti vā (Pā. A. 2, Pā. 5, sū 93); indro jīvaḥ sarvadravyeṣvaiśvaryayogāt viśayeṣu vā paramaiśvaryayogāt, tasya liṅgamindriyaṁ, liṅganāt sūcanāt pradarśanādupaṣ-ṭambhanād—vyañjanācca jīvasya liṅgamindriyaṁ—
TS. Bhā., II. 15, p. 162.
4. Bhs., 1. 7. 61, 7.

etymology in their respective works in details, while Ācārya Hemcandra,¹ the independent Jaina grammarian also has given position to it in his own Vyākaraṇa Sūtra and Vṛtti in full details. The other point is that the etymology of the word 'Indriya' is not found in any Vedic philosophical work except in the very oldest commentarial works of the Pāṇini Sūtra, just as it is come accross in the Buddhist and Jaina texts. It is known that the etymology of the word 'Indriya', having found place in the Buddhist and Jaina philosophical treatises, became the subject of speculation of the philosophers. As for example, in the Māṭharavṛtti,² the oldest Vedic philosophical treatise, there is preserved the etymology of the word 'Indriya', but it is quite different and distinguishable from that recorded in the Buddhist and Jaina works. It is gratifying to note that when the nirukti (etymology) of this word 'Indriya', having left the field of word, entered into that of philosophy, then the stamp of the philosophical community got impressed on it. Buddhaghosa³ speaks of all those meanings as spoken of by Pāṇini in the nirukti of the word 'Indriya', but he has made an attempt to adopt it by stating the meaning of Indriya as Sugata.⁴ The Jaina Ācāryas interpret the meaning of the word 'Indriya' as only Jīva generally; they have not made the meaning of it as Tīrthāṅkara like Buddhaghosa as desired by himself.

According to the Sāṃkhya, the material cause of the indriyas (sense-organs) is abhimāna (ego) which is a kind of fine substance produced from Prakṛti.⁵ This view is acceptable

1. Indriyam', Hemaśabdānuśāsanāṃ, 1. 174, p. 128.
2. In iti viṣayāṇām nāma, tāninaḥ viṣayān prati dravantīti indriyāṇi, Māṭharavṛtti, kā. 26, p. 43.
3. Ṭippan, 2, Darśana and Cintana, p. 134.
4. Ko Pana nesaṃ indiyattho nāmāti ? indraliṃgaṭṭho indriyattho...bhagavā hi sammāsaṃbuddho paramissariyabhāvato indoattho vinicchayo VM. XVI. 4, 5, 6.
5. Sāttvika ekādaśakaḥ pravartate vaikṛtādabhaṅkārat Bhūtādestanmātraḥ sa tāmasaḥ, taijasādubhayaṃ
—Sāṃkhyakārikā, 25.

to the Vedānta. The Nyāya¹ maintains that the cause of the indriyas is the five elements like earth, etc., which are nothing but non-living substances. This view is acceptable also to the Pūrva Mīmāṃsakas. According to the Buddhist philosophy, the five sense-organs, because of being produced from rūpa (Matter), are called rūpa, which is particularly non-living. Jaina philosophy also makes reference to particular matter as the cause of the gross physical sense-organs (dravyendriyas), which is a particular non-living substance only.

The external shapes like kaṇṇaśaṣkultī, akṣigolakakṛṣṇasāra, tripuṭikā, Jihvā and carma (ear-drum, eye-socket-pupil, nose, tongue and skin), which the common people call by the order of the names—kaṇṇa, netra, ghrāṇa, rasanā and tvak—indriyas (sense-organs of hearing, sight, smell, taste and touch) respectively, have been accepted as indriyādhiṣṭhāna² (places or substrata of sense-organs) in all Indian systems of thought, but not as indriyas. Indriyas have been accepted as intangible entities existing in those shapes whether they are material or egoistic. Jaina philosophy, having accepted those material adhiṣṭhānas as dravyendriya (physical sense-organ) even, has indicated the same idea that adhiṣṭhānas are not really indriyas. According to this school, indriyas are intangible. But they, being not material (bhautika) or egoistic non-living substance, are consciousness or sentient capacity—like which is called bhāvendriya (psychical sense-organ) by the Jainas. The sixth indriya called manas (mind) has been accepted as the internal sense-organ in all the Indian systems of thought. Like these six buddhīndriyas (organs of intellect) are common to all philosophies. But it is only the Sāṃkhya philosophy which mentions eleven indriyas³ by counting the five karmendriyas (sense-organs of action), viz.

1. Ghrāṇarasanacakṣustvakśrotrāṇīndriyāṇi bhūtebhyah,
—NS., I. 1. 12.
2. Nyāyamañjarī, p. 477.
3. Abhimāno ahaṅkārastasmād-dvividhaḥ pravartate sargaḥ.
Ekādaśakaśca gaṇastanmātraḥ pañcakaścaiva.—Sāṃkhya-kārikā, 24.

speech, hands, foot, anus and the organ of procreation¹ as indriyas. Just as Vācaspati Miśra and Jayanta Bhaṭṭa² spoke against the acceptance of karmendriyas of the Sāṃkhya as indriyas, just so Ācārya Hemacandra also, having refuted indriyatva (the state of sense-organ) of karmendriya, followed the previous Jaina Ācāryas like Pūjyapāda and others who argued in this manner: "This is the section dealing with consciousness. Those that are the instruments of consciousness alone are mentioned here, and not those that are the instruments of activity as these have no such limits. All the limbs and minor limbs are the instruments of activity. And these are determined by name-karmas of limbs and minor limbs. Moreover, the instruments of action are not five only."³

Here the question arises when Ācārya Pūjyapāda and other old Jainācāryas and scholars like Vācaspati, Jayanta Bhaṭṭa and others have forcefully refuted the eleven indriyas of the Sāṃkhya, then why have they not denied or mentioned the number of twenty-two indriyas⁴ which are well known in the Buddhist Abhidharma work.⁵ It is known that in the Buddhist

1. BuddhIndriyāṇi cakṣuḥśrotraghrāṇarasanasparśanakāṇi. Vākpāṇipādaṇyūpasthān karmendriyāṇyāhuḥ.—Sāṃkhya-kārikā, 26.
2. Tātparyatīkā, p. 531; Nyāyamañjarī, p. 483.
3. Pañcendriyāṇi bhavanti, ārambho niyamārthaḥ ṣaḍādipratishedhārthāśca. TS., Bhā., p. 162; Sarvārthasiddhi, p. 174.
4. Dhātūnaṃ anantaraṃ uddiṭṭhāṇi pana, indriyāṇi ti bāvīsatī indriyāṇi : cakḥhundriyaṃ, sotindriyaṃ, ghāṇindriyaṃ, jihvindriyaṃ, kāyindriyaṃ, manindriyaṃ, itthindriyaṃ, purisindriyaṃ, jīvitindriyaṃ—sukhindriyaṃ dukkhindriyaṃ somanassindriyaṃ, domanassindriyaṃ, upekkhindriyaṃ, sad-dhindriyaṃ, vīriyindriyaṃ, satindriyaṃ, samādhindriyaṃ, paññindriyaṃ, anaññātāññassāmītindriyaṃ aññindriyaṃ aññātāvindriyaṃ ti.—VM.; XVI, 1.
5. Abhidharmakośa, Sphuṭārthā, 95; VM., XVI, 1. 2 ff., Darśana and Cintana, p. 137.

Abhidharma tradition there was a common custom of referring to every mānasaśakti (mental power) by the word 'indriya'. Having thought thus, they have not mentioned or refuted that tradition. Objects like sound, colour, smell, taste, touch, etc., are always apprehensible to the six sense-organs. In this regard all the systems of thought are of one view, but there is the difference of opinion of the Nyāya-Vaiśeṣika from all others. Systems of thought with regard to the apprehensibility of substance by the indriyas. All other philosophies, even having accepted indriyas as the apprehenders of quality, admit six sense-organs as the apprehenders of substance, while the Nyāya-Vaiśeṣika and the Pūrvaśālikas call eye, tactile organ (sparśanendriya) and mind as the only apprehenders of substance, but not others.¹ Ācārya Hemacandra has expressed this difference of opinion, having spoken of karma-bhāva-pradhānavūtpatti of the words, such as, sparśa (touch), etc., and along with it he followed the previous Ācāryas.

The discussion on indriya-ekatva (singleness or oneness of sense-organ) and multiplicity of indriyas is very old in the metaphysical tradition.² Some, having accepted the sense-organ as one, has supported its many functions by its many sthānas (places), while all the advocates of the multiplicity of sense-organs maintained only the principle of multiplicity of sense-organs by refuting the view of singleness of the sense-organ. In regard to this Ācārya Hemacandra, having recourse to the method of the relative point of view, followed the old Jainācāryas by making a synthesis of both the theories, i. e. mutual singleness and multiplicity in sense-organs, and avoided the faults attributed to each other in the case of every extreme view.

Indriyas (sense-organs) are of two kinds, viz. Dravyendriya (physical sense-organ) and Bhāvendriya (psychic sense-

1. Muktāvalī, kā, 53-56.

2. Sthānānyatve nānātvādayavinānāsthānatvācca saṁśayaḥ.

organ).¹ Dravyendriya, because of being produced from matter is non-living matter-like (physical), but Bhāvendriya is knowledge-like because it is the mode of Cetasākti (capacity of consciousness).² Dravyendriya is produced by the rise of aṅgopāṅga (limbs)—and nirmāṇanāmakarma (i. e. constitution-making nāmakarma)³. There are stated to be two divisions of it, viz. nirvṛtti and upakaraṇa⁴ (accomplishment and means).

The name of the shape (or form), of sense-organs is nirvṛtti. It is also divided into two kinds, viz. bāhya (external) and ābhyantara (internal).⁵ The external shape or form of sense-organ is called bāhyanirvṛtti, while the name of the internal shape or form is ābhyantanirvṛtti. The external part is just like the sword, while the internal part is like the sharpness of it which is made of very fine translucent atom. Both material and psychical natures of the internal nirvṛtti have been described. Upakaraṇa is the means of nirvṛtti; it is also external and internal.⁶ In regard to the shape of sense-organs it should be noted that there are many kinds of shape of skin, but there is no difference in its external and internal shapes.

The internal shape of skin of any being is just like the

1. Dvividhānīndriyāṇi bhavanti—dravyendriyāṇi bhāvendriyāṇi ca—TS. Bhā., II, 16, p. 163.
2. Sāmānyataḥ dravyamayāṇi dravyātmakāṇi dravyendriyāṇi, bhāvendriyāṇi tu bhāvātmakānyātmaparīṇatirūpāṇi
—TS. Bhā., p. 164.
3. Ibid., p. 164.
4. Nirvṛtṭyupakaraṇe dravyendriyaṁ, TS., II. 17; Tatra nirvṛtṭīndriyamupakaraṇendriyaṁ ca dvividham dravyendriyaṁ.—TS. Bhā. II, 17.
5. Nirvṛttiraṅgopāṅganāmanirvartitānīndriyadvārāṇi, karma-viśeṣasaṁskṛtāḥ śārīrapradesaḥ, nirmāṇanānāṅgopāṅga-pratyayamūlaguṇanīrvartanetyartāḥ. Ibid., p. 164.
6. TS, Pt. I, pp. 164, 165.

external shape of skin.¹ But in the case of other sense-organs it is not so. Except skin the internal shapes of all other sense-organs are not identical with their external shapes. The internal shapes of kindred sense-organs of all classes of animals have been accepted as of one and the same type. As for instance, the internal shape of the ear is like the shape of a kadamba-flower, that of the eye is like the lentil, that of the nose is like the atimuktaka flower, that of the tongue is like khurupā (dagger or weeding agricultural implement). The internal shape of the skin is of different kinds.²

The external shapes of all the sense-organs are different in all cases of animals, as for example, ears, eyes, noses and tongues of man, elephant, horse, cow, cat, rat, etc.³

All these five sense-organs are individually an innumerable part of an aṅgula (finger) by thickness (bāhalla), while the ear is an innumerable part by width (pohatta); thus upto that of the eye and nose; the tongue is one aṅgula (finger) by width (pohatta); and the skin is equal to the extent of the body. These five sense-organs are endowed with infinite units (anantapradeśikas) and immersed in countless space-points (asamāhyeyapradeśāvagāḥa). The least of all these is the eye.⁴

The capacity of apprehending objects by internal nirvṛtti (formation) is called upakaraṇendriya.⁵

Bhāvendriya (psychic sense-organ) is of two kinds, viz. labdhirūpa (mental faculty-like) and upayogarūpa (conscious-

1. TS., Pt. I, pp. 165.

2. Bhs., 2.4. 499; Prajñā, 15, 191; Pañcadaśa, Indriyapada, Prathama Uddeśaka; Fourth Karmagrantha, pp. 36-37; TS., ch. II, 17-18 and vṛtti; Viśeṣāva., gāthā, 2993-3003 and Lokaprakāśa, Sarga, 3, Sl. 464 ff.

3. TS., Pt. I, p. 165.

4. Pannā., 5, Indriyapada, appabāhūdāraṁ, 191, p. 166.

5. TS., Pt. I, p. 164.

ness-like).¹ The kṣayopaśama of Matijñānāvaraṇa—the particular capacity of consciousness is called labdhirūpabhāvendriya. The pravṛtti (action) which takes place in the apprehension of objects by soul according to this labdhirūpabhāvendriya is called upayoga-rūpa bhāvendriya.²

According to the Buddhist philosophy, "The translucent matter of sense-organs (rūpapasāda) is very subtle; it is like the shining of a jewel, it cannot be cut in two,³ it cannot be burnt,⁴ it has no weight,⁵ it disappears without a residue at death.⁶ It is nevertheless atomic, and is represented by five different kinds of atoms. The atoms of the organ of sight (cakṣurindriya) cover in concentric circles the eye ball. The atoms of the organ of taste, or more precisely that matter which is supposed to convey the sensation of taste, covers in concentric semicircles the tongue. The atoms of the organs of touch (kāyendriya) cover the whole body.⁷ The idea that all these different kinds of special matter are, indeed, the same translucent subtle stuff covering the whole body and disappearing at death had also its advocates, who consequently reduced all

1. Labhyupayogau bhāvendriyaṃ, TS., II. 18, p. 166.
2. Labdhirūpayogastu bhāvendriyaṃ bhavati, labdhirnāma gati-jātyādināmakarmajanitā tadāvaraṇīyakarmakṣayopaśamajanitā ca, indriyāśrayakarmodayanirvṛttā ca jīvasya bhavati. TS. Bhā., p. 166.
3. Chinatti chidyate caiva bhāyaṃ dhātu catuṣṭayaṃ Dahyate tulayatyevaṃ vivādo daghṛtulyayoḥ. Abh. K. 1.36, Tibetan Text, p. 63; Abh. K., 1. 36, Yaś. Comm.
4. Abh. K., 1. 36, Tibetan Text, p. 36. 13.
5. Ibid.
6. Vipākajaupacayikāḥ pañcādhyātmaṃ vipākajāḥ Na śabda apratighā astau naiṣyandika vipākajāḥ; mṛtasyānanuvṛtteḥ; Abh. K., 1.37. Yaśomitra.
7. Tribhirghrāṇādibhistulyaviśayagrahaṇaṃ matam. Caramasyāśrayo atītaḥ pañcānāṃ sahajaśca taiḥ. Abh. K., 1.44.

senses to one, the sense of touch, but this did not find general acceptance. Being as subtle as the shining of jewel, this matter cannot appear alone; it is supported by gross matter (mahā-bhūta) of which the eye ball and flesh in general consist."¹

A comparative study of Indriyas by all Indian systems of thought in brief reveals that the Jaina view on them from their physical and psychic aspects is more subtle and thought-provoking as they have been accepted as representing translucent matter.

SECOND SECTION

KARMA

All forces of life and Nature are associated together in the principle of cause and effect—the central theme of studies of all branches of knowledge. The fundamental law of causation pervades the entire sphere of physical and psychic worlds, governing the process of origination, continuity and decay of the substances—living and non-living, gross and fine, developed and undeveloped. A universal law of causation explains and interprets the psycho-physical actions and reactions of beings, which are manifested in the forms of thoughts, feeling and behaviour.

According to Jaina philosophy, soul is endowed with consciousness, infinite modes of knowledge, self-awareness, conduct, and of the attribute of neither heaviness nor lightness respectively, from the stand-point of condition in its perfect eternal state. But the worldly souls are imperfect, for their innate faculty is clouded by a very fine foreign element intangible to the senses which is called Karma and is an aggregate of material particles. This karma-pudgala (karmic matter), having entered into the mundane soul through the mental, vocal and bodily actions, causes certain conditions in it due to the modifications of consciousness comprising four passions, viz. anger, pride, deceitfulness and greed.

1. The Central Conception of Buddhism, p. 10-11.

NATURE OF KARMA-PUDGALA (KARMIC MATTER)

The common meaning of the word 'Karma' is action and this meaning of its come across in the Vedic tradition from the Vedic age up to the Brahmanic period. In this tradition *naimittika kriyās* (occasional ceremonies) of day-to-day life, such as, sacrifice, etc., have been called Karma. It was admitted that the performance of these actions was made in order to please the gods so that they would fulfil the desire of the performer.¹ The meaning of Karma as action is accepted in the Jaina tradition, but the Jainas do not admit only this meaning as it is pointed out. Each and every activity of the worldly beings or desire is infact Karma, but in the Jaina tradition it is called *Bhāvakarma*. The non-living material substance which makes soul in bondage, having come into contact with it, due to that *Bhāvakarma* (i. e. action of soul) is called *Dravyakarma*.² It is *Pudgaladravya* (material substance); its appellation of Karma (*karmasamjñā*) is analogical (*upacārika*), for it is the activity of soul or it is produced by its action, hence it is also called Karma. Here *upacāra*(analogy) of the cause is made to be in the effect. That is, according to the Jaina definition, there are stated to be two kinds of Karma, viz. *Bhāvakarma* and *Dravyakarma*.³ The activity of Soul is *Bhāvakarma* and its effect is *Dravyakarma*. There exists a relation of cause and effect between these two Karmas; *Bhāvakarma* is a cause and *Dravyakarma* is an effect. But this cause-effect relation is similar to the cause-effect relation of the hen and its egg. Egg is produced from the hen, hence it is a cause and the egg is an effect. It is true, but the hen also is born of the egg.⁴ Therefore, there is the cause-effect relation.

1. *Mīmāṃsā*, 2. 1. 5.

2. *Kammattaṇeṇa ekkam davvaṃ bhavetti hodi duviharṃ tu Poggalapinḍaṃ davvaṃ tassatti bhāvakammaṃ tu—saṭṭ.*, Vol. 15,6.

3. *Ibid*.

4. *Aṃḍae pacchā kukkudī puvviṃ kukkudī pacchā aṃḍae, Rohā ! see naṃ aṃḍae kao ? Bhagavaṃ, kukkudīo sā. naṃ*

in both of them. But it cannot be said which is the first or prior. From the point of view of *santati* (continuity) their cause-effect relation is beginningless. Similarly, *Dravyakarma* is produced from *Bhāvakarma*, so *Bhāvakarma* is accepted as a cause and *Dravyakarma* as an effect. But the consumption (*niṣpatti*) of *Bhāvakarma* does not take place in the absence of *Dravyakarma*. Therefore, *Dravyakarma* is a cause of *Bhāvakarma* and *Dravyakarma* exists like the relation between the hen and its egg from the point of view of continuity (*santati*). Although the cause-effect relation of *Bhāvakarma* and *Dravyakarma* is beginningless from the stand-point of continuity; nevertheless, it is known from individual consideration that the cause of some one *Dravyakarma* will be some one *Bhāvakarma*; therefore, the relation of priority and posteriority between them can be determined, for one *Bhāvakarma* from which one particular *Dravyakarma* is produced is the cause of this *Dravyakarma* and this *Dravyakarma* is the effect of that *Bhāvakarma*, but not the cause. Similarly, it is to be admitted that even there being individually prior and posterior states, both of them are beginningless from the point of view of class because of there being the absence of *pūrvāparabhāva* (prior and posterior states).

It is evidently clear that *Dravyakarma* is born of *Bhāvakarma*, because Soul becomes in the bondage of *Dravyakarma* only due to its transformations like attachment, aversion and delusion, i. e. it travels in the world without attaining liberation. The reason why has *Dravyakarma* been accepted as the cause in the production of *Bhāvakarma* is this that if the production of *Bhāvakarma* is possible in the absence of *Dravyakarma*, there will be the emergence of *Bhāvakarma* in the liberated souls and again they will have to come down to this human world. Moreover, there will be no difference between the world and liberation. It will have to be accepted that there

kukkaḍḍī kao ? Bhaṁte ! aṁḍayāo evāmeva Rohā ! se ya aṁḍae sā ya kukkuḍḍī. puvvimpete pacchāpete duvete sāsaya bhāvā, anānupuvvī esā Rohā—Bhsa., 1. 6. 53.

is the capacity in the liberated soul, to be in bondage, just as it is the case with the worldly soul. In such a condition no man will strive for attaining liberation. Therefore, it must be admitted that there is no Bhāvakarma in the liberated soul because of the absence of Dravyakarma in it. And there takes place the emergence of Bhāvakarma in the worldly soul on account of there being Dravyakarma. In this way, the worldly life is beginningless for the soul owing to the cause of origination of Dravyakarma from Bhāvakarma and that of Bhāvakarma from Dravyakarma since the beginningless time.

The emergence of Dravyakarma takes place from Bhāvakarma; therefore, Dravyakarma is the effect of Bhāvakarma; such is the relation of cause and effect. Just as the lump of earth which changes into the form of a jar is the material cause, but it cannot become jar in the absence of a potter, even though there is the capacity in it to become a jar, therefore, the potter is the efficient cause, just so there is the capacity in Pudgala (Matter) to undergo transformation into the form of Karma, hence it is the material cause. But the material substance (Pudgaladravya) cannot change into the form of Karma until there is no existence of Bhāvakarma in Soul. For this reason Bhāvakarma is the efficient cause. Similarly, Dravyakarma also is the efficient cause of Bhāvakarma. That is to say, the cause-effect relation of Dravyakarma and Bhāvakarma is *nimittanaimittikarūpa* (occasion-occasionedlike), for not becoming *upādānā-upādeyarūpa* (material cause and effect caused by it).¹

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1. For example, (1) A is the *Upādāna-kāraṇa* of B.
 - (2) B is the *upādeya* of A.
 - (3) B is the *upādāna* of C.
 - (4) C is the *upādeya* of B.

Three stages are involved in the process of matter which aggregates in the material world, e. g. water-karma-fire. Similarly, three stages of mind are involved in the mental world : (1) thought of being harmed, (2) anger and (3) thought of harming. If the earlier stage of mind causes a

The pravṛtti (activity) of the worldly soul is called Bhāva-karma; the four internal transformation of the soul, viz. anger, pride, deceitfulness and greed are called Bhāvakarma or the internal transformations of it, viz. attachment, aversion and delusion are Bhavākarma. The worldly soul is constantly associated with the body, so its activity is not possible without the support (base) of mind, speech and body. The emergence of the internal transformations like the four passions, or attachment, aversion and delusion of the soul takes place by the activities of mind, speech and body. In other words, it can be said that the mental, vocal and bodily activities of the worldly soul which are also called yoga (activity) are tinged with the colour of attachment, aversion and delusion or four passions (kaṣāyas). In fact, pravṛtti (activity) is one, but just as a piece of cloth and its colour are called different, just so there are also two names of this pravṛtti of soul, viz. yoga (activity) and kaṣayā (passion). Just as a new piece of cloth devoid of colour is of one colour, just so the pravṛtti of mind, speech and body free from the colour of passion is of one colour. Just as the colour of a piece of cloth is sometimes light and some-

later stage of mind, the former is upādāna and the latter is upādeya. If the earlier stage of matter causes a later stage of matter, the former is upādāna and the latter is upādeya. e. g. water particle, Karma-particle, earth particle.

Nimitta : If a stage of mind cause a state (stage) of matter or vice versa, then the cause is nimitta and the effect is naimittika.

- e. g. 1. Cause—anger (mental stage), effect :—Karma particle, becoming earth particle (material stage).
 2. Cause —Water particle becoming karma-particle (material happening)
 3. Effect —anger (mental happening).

That is to say, when the like causes the like, it is upādāna-upādeya, when the unlike causes the unlike, it is nimitta-naimittika.

times deep, just so this Bhāvakarma is sometimes intense and sometimes mild in the presence of the colour of passion with the operation of activity (yogavyāpāra); just as a piece of cloth devoid of colour can be small or large, just so the activity free from passion can also become more or less. But there becomes the absence of intensity of mildness (mandatā) of luminosity, being the cause of colour. For this reason, the importance of colour-communicating passion is more with regard to activity. Therefore, only passion is called Bhāvakarma. In the binding of Dravyakarma both activity and passion¹ have usually been accepted as the efficient cause, still this is the reason of accepting only passion as Bhāvakarma. In a nutshell, the four passions (kaṣāyas)—anger, pride, deceitfulness and greed or the faults—attachment, aversion and delusion² are Bhāvakarma. Soul becomes bound by receiving Dravyakarma from them.

1. Jogā payaḍipāsaṃ tñi aṇubhāgaṃ kaṣāyāu—Pañcamakarmagrantha, Gāthā, 96; Bhs. 9. 33. 385.

2. Rāgo ya doso vi ya kammabīyaṃ,
kammaṃ ca mohappabhavaṃ vyaṃti,
kammaṃ ca jāṃmarāṇassa mūlaṃ,
dukkhaṃ ca jāṃmarāṇaṃ vyaṃti—Uttarā., 32. 7;
Carittamohaṇaṃ kammaṃ, duvīhaṃ tu viyāhiyaṃ
Kaṣāyamohaṇijjaṃ tu, nokasāyaṃ taheva ya—Ibid. 33.10;
Sakaṣāyatvājjīvaḥ karmaṇo योग्यं pudgalānādatte; Ts., VIII. 2;

Dohi tñāṇehiṃ āyā ahe logaṃ jāṇai pāsai, taṃ samohaṇaṃ
ceva appaṇaṇaṃ āyā ahe logaṃ jāṇai pāsai, asamohaṇaṃ
ceva appaṇaṇaṃ āyā ahe logaṃ jāṇai pāsai, adhoḥi samohayā
samohaṇaṃ ceva appaṇaṇaṃ āyā ahe logaṃ jāṇai
pāsai—Sthānāṅga Sūtra, 2. 2. 114;

Micchattaṃ puna duvīhaṃ jīvamajīvaṃ taheva aṇṇāṇaṃ
Aviradi jogo moho kodhādiyā ime bhāvā—Samayasāra 94;
Uvaogassa aṇāi pariṇāmaṃ tiṇṇi mohajuttassa

Micchattaṃ aṇṇāṇaṃ aviradi bhāvo ya nādavvo—Ibid. 96;
Jaṃ bhāvaṃ suhamasuhaṃ kareḍi ādā sa tassa khalu kattā
Taṃ tassa hodi kammaṃ so tassa du vedagā appā—Ibid. 109;

The Nyāya-Vaiśeṣika view on Karma

Other Indian systems of thought have admitted this doctrine of Karma by different appellations. The Naiyāyikas have accepted the three vices of faults, viz. *rāga* (attachment), *dveṣa* (aversion) and *moha* (delusion). The *pravṛtti* (activity) of mind, speech and body of beings takes place on receipt of the impulse from these vices. Merit and demerit or virtue and vice (*dharma* and *adharma*) originate from this *pravṛtti*. *Dharma* and *Adharma* (merit and demerit) have been called by the Naiyāyikas as *Samśkāras* (forces).¹

These three faults—*rāga* (attachment), *dveṣa* (aversion) and *moha* (delusion) as mentioned in the Nyāya are accepted by Jaina philosophy as *Bhāvakarma* by name. That which is called by the Naiyāyikas as *pravṛtti* produced from *doṣa* is named as *yoga* (activity) in Jaina metaphysics. The Naiyāyikas have attributed the name 'Samśkāra' (force) or *Adṛṣṭa* (unseen force) to *dharma* and *adharma* (merit and demerit) born of *pravṛtti* (activity); that is the place of *Paudgalika-Karma* or *Dravyakarma* in Jaina philosophy. In the Nyāya view *Samśkāra* like *dharmādharmā* is the quality of Soul. But it should be noted that only Soul is conscious because of there being the difference between quality and its substratum according to this view, its quality cannot be called conscious, for there is no inhering relation of consciousness in *Samśkāra* (force). The Jaina *Dravyakarma* also is non-conscious, there-

Cahuviha aṇeyabheyaṃ bāṃdhate nāṇadaṃsaṇaḡuṇehim
Samaye samaye jamhā tena avaṃdhutti nāṇī du, Samayasara
177, Mohaṇa vā rāgeṇa vā doseṇa va pariṇadassa jivassa
Jāyadi viviho bāṃdho tamhā te saṃkhavaidavvā.

—Pravacanasāra. 1. 84;

Jo moharāḡadose nihaṇadi uvaladdha joṇhamuvadesaṃ
so savvadukkhāṃokkhaṃ pāvadi acireṇa kāleṇa, Ibid. 1.88.

1. NBhā., 1. 1. 2; NS., 4. 1. 3, 17;

Evāṃ ca kṣaṇabhaṅgitvāt saṃskāradvārikāḡ sthitaḡ sa kar-
majanyasaṃskāro dharmādharmajirocyate, NM., p. 472;

see also NM., pp. 471, 500, etc; see PPBhā., about *pravṛtti*.

fore, both Saṃskāra and Dravyakarma, as they may be called, are non-conscious. In both the views the difference is this that according to the Naiyāyikas, Saṃskāra is a quality of Soul, while Dravyakarma of the Jainas is Pudgaladravya (material substance). On deep consideration this difference also appears to be negligible. The Jainas accept this proposition that Dravyakarma originates from Bhāvakarma, the Naiyāyikas also admit the origination of Saṃskāra. The real significance of the postulation that Bhāvakarma has produced Dravyakarma is this that Bhāvakarma has made some such Saṃskāra as a result of which Pudgaladravya has been changed into the form of Karma. Like this the particular Saṃskāra which took place in Pudgala (Matter) due to Bhāvakarma is real Karma, according to the Jaina view. This Saṃskāra (impression or force) is non-different from Pudgaladravya, therefore, it is called Pudgala. Under such conditions there does not exist any particular difference between Saṃskāra of the Naiyāyikas and Dravyakarma of the Jainas.

The Jainas accept the subtle body called 'kārmaṇaśarīra' also over and above the gross body. There takes place the birth of the gross body because of this karmic body. The Naiyāyikas call 'kārmaṇa-śarīra' as avyakta-śarīra' (unmanifest-body)¹. The Jainas accept it to be intangible to the sense; for this reason, it is really unmanifest. It appears here that the thought on liberation came later on.

The Vaiśeṣika conception of Karma is identical with that of the Nyāya. Adṛṣṭa (unseen force) is one of the twenty four qualities as propounded by Praśastapāda. This quality is different² from Saṃskāra-guṇa (quality of force). It has been

1. NV., 3. 2. 68.

2. Guṇāśca rūparasagandhasparśasaṃkhyāparimāṇapṛthaktva-saṃyogavibhāgaparatvāparatvabuddhisukhaduḥkhecchā-dveṣaprayatnāśceti kaṇṭhoktāḥ sapta-daśa / ca śabdasaṃcitāśca gurutvadratvasnehasaṃskārādṛṣṭaśabdāḥ saptaivetyevaṃ caturviṃśati guṇāḥ—PPBhā., p. 3 and pp. 637, 643.

divided into two kinds, viz. dharma and adharma (merit and demerit). It is known by this that Praśastapāda has made mention of dharma and adharma by the word 'Adṛṣṭa' instead of the word 'Saṃskāra'. From this fact only the difference of name should be understood, without having accepted the difference of postulation, for Praśastapāda has accepted 'Adṛṣṭa' as the quality of Soul, as much as equal to 'Saṃskāra' of the Naiyāyikas. In the Nyāya-Vaiśeṣika philosophy this tradition of the origination of Saṃskāra from doṣa (fault), birth from Saṃskāra (force), doṣa (fault) from birth and again Saṃskāra (force) from doṣa (fault) has been regarded as beginningless like the seed and the sprout. This is just like the afore-said beginningless tradition of Bhāvakarma and Dravyakarma of the Jains.¹

THE SĀMĀNYA-YOGA VIEW ON KARMA

There is very much sameness of the doctrine of Karma of the Yoga philosophy with the doctrine of Karma of Jaina metaphysics. According to the Yoga, avidyā (ignorance), asmitā (egoism), rāga (attachment), dveṣa (aversion) and abhiniveśa (affection) are the five kleśas (afflictions).² Due to them there takes place (i. e. originates) the tenacity of mundane existence—the activity of mind (vṛtti) and from it there are produced Saṃskāras (forces) like dharma and adharma (merit and demerit); kleśa (affliction) can be equated with Bhāvakarma, vṛtti with yoga and Saṃskāra with Dravyakarma.

1. Nanvevamapyavidyāparikalpita'eṣa brahmajīvātmavi-bhāgaḥ,.....kasyaiṣa doṣa yadi cānāditvamasya parihāro brjāṅkuravadbhaviṣyati, bhavadbhirapi cānyamanādireva saṃsāro abhyupagataḥ avidyaiva ca saṃsāra ityucyate—NM., p. 513/95.

2. Avidyā asmitārāga dveṣā'bhiniveśāḥ pañca kleśāḥ—Yogasūtra, 2. 3.

In the Yoga philosophy *Samskāra* is called *Vāsanā* (desire), *karma* (action), and *apūrva* (energy) also. Moreover, in this view the cause-effect relation of *kleśa* and *karma* has been accepted as beginningless¹ like the seed and the sprout as much equal to *Bhāvakarma* and *Dravyakarma* of Jaina metaphysics.

In regard to the doctrine of Karma the difference between the Jaina and Yoga views is this that according to the latter, the relation of all these, *kleśas* (afflictions), *kliṣṭavṛtti* (afflicted activity) and *Samskāra* (force) is not with Soul, but rather with *citta* (mind) or *antaḥkaraṇa* (internal sense-organ) and this *antaḥkaraṇa* is the modification of *Prakṛti*. According to the Jaina view, there is the relation of the material karmic body with Soul due to the dispositions—*moha* (delusion), *rāga* (attachment) and *dveṣa* (aversion), since a beginningless time there exists a relation of cause-effect (*kārya-kāraṇa*) between *bhāvas* (dispositions) and the *kārmaṇaśarīra* (karmic body) like the seed and the sprout. In the origination of one, the other exists as cause; nevertheless, both of them are in association with Soul from a beginningless time. It is impossible to determine which is the first between them.

Similarly, in the *Sāṃkhya* view, the subtle body (*liṅgaśarīra*) is in association with *Puruṣa* (self) from the beginningless time. The subtle body (*liṅgaśarīra*) originates from the dispositions (*bhāva*) like *rāga* (attachment), *dveṣa* (aversion) and *moha* (delusion) and there is also a cause-effect relation between the dispositions and the subtle body like the seed and the sprout.² Just as the Jainas accept the gross body as

1. *Vṛttayaḥ pañcayāḥ kliṣṭākliṣṭāḥ*—Yoga, I, 5; *Yogabhāṣya*, 1. 5; *Ibid.*, 2. 3.

Tatra puṇyāpuṇyakarmāśayaḥ

kāmalobhamohakrodhaprasavaḥ "...etc., *Ibid.*, 2. 12.

Satsu kleśeṣu karmāśayo vipākārambhī bhavati, nocchinnakleśamūlaḥ I", *Ibid.*, 2. 13. etc.

See also their *Tattvavaiśārādī*, *Bhāsvatī*, etc., commentaries.

2. *Māṭharavṛtti*, 52; *Tattvakaumudī vyākhyā*, 52.

separate and distinct from the karmic body, so the Sāṃkhya also accepts the subtle body as different from the gross body.¹ In the Jaina view both the gross and fine bodies are material; in the Sāṃkhya view also these two are Prākṛtic (of primordial Matter). The Jainas, having accepted both the bodies as the modifications of Matter even, regard the classes of both as different. According to the Sāṃkhya, the one is tanmātrīc (infra-atomic) and the other is born of parents. In the Jaina view, the gross body becomes separate at the time of death and a new body is produced at the time of birth. But the karmic body goes along with Soul from one place to another place of birth at the time of death and thus it exists. The Sāṃkhya also postulates that the gross body born of parents does not remain with the self at the time of death and a new body is produced on the occasion of the next birth. But the liṅgaśarīra (subtle body) exists as permanent and moves from one place to another.² According to the Jaina system of thought the karmic body associated with Soul since a beginningless time ceases to be at the time of liberation. Similarly, it is maintained in the Sāṃkhya that there takes place the cessation of the liṅgaśarīra (subtle body).³ In the Jaina view kārmaṇaśarīra and dispositions (bhāvas) like rāga (attachment), dveṣa (aversion), etc., remain with Soul from a beginningless time; without the one there is no existence of the other. Like this, in the Sāṃkhya view the liṅgaśarīra also does not exist without dispositions and vice versa.⁴ According to the Jaina view, kārmaṇaśarīra is non-

1. Sūkṣmā mātāpitṛjāḥ saha prabhūtaistrīdhā viśeṣāḥ syuḥ
Sūkṣmāsteṣāṃ niyatā mātāpitṛjā nivartante—
Sāṃkhyakārikā, 39
2. Mātharakārikā, 44, 40; Yogadarśana, 2. 13; Bhāsvatī's
commentary; Sāṃkhyakārikā, 40.
3. Liṅgaṃ pralayakāle pradhāne layaṃ gacchati iti liṅgaṃ
—Mātharavṛtti, 40
4. Citraṃ yathāśrayamṛte sthānvādibhyo yathā vinā chāyā
Tadvadvina Rviśeṣaiḥ na tiṣṭhati nirāśrayaṃ liṅgaṃ
—Sāṃkhyakārikā, 41.

resisting (aghāta) or unimpeded; the Sāṃkhya also maintains that the liṅgaśarīra is endowed with unimpeded motion; it is not to face any resistance.¹ In the Jaina view there is no capacity of enjoyment in kārmaṇaśarīra but the gross body enjoys by the senses. Similarly, in the Sāṃkhya view also the liṅgaśarīra is devoid of the capacity of enjoyment.²

Although according to the Sāṃkhya view, the dispositions like rāga, etc., are the modifications of Prakṛti (Primordial Matter), liṅgaśarīra also is the modification of Prakṛti, and the other material objects are as such, even then the Sāṃkhya does not deny the categorical divisions existing in all these modifications. It accepts three kinds of sarga (creation), viz. pratyayasarga (evolution or creation of intellect), tanmātrīc sarga (infra-atomic creation) and bhautika-sarga (material evolution or creation).³ The dispositions, such as, rāga, dveṣa, etc., are included in the pratyayasarga⁴ and the subtle body is in the tanmātrīc sarga (infra-atomic creation or evolution of rudimentary elements).⁵ Similarly, in the Jaina view the dispositions like rāga, etc., are produced from matter; and so also is the case with the kārmic body. But the basic difference between these two views is that the material cause of dispositions is Soul and the efficient cause of them is Matter, while the material cause of the kārmic body is Matter and the efficient cause is Soul.

1. Pūrvotpannamasaktam nityam mahadādisūkṣmaparyantaṁ
Saṃsarati nirūpabhogaṁ bhāvairadhivāsitaṁ liṅgaṁ
— Sāṃkhyakārikā, 40.

2. Ibid.

3. Tattvakaumudī, 52, 53.

4. Eṣa pratyayasargo viparyayāśaktituṣṭisiddhyākhyāḥ
Guṇavaśaṃyavimardāttasya bhedāstu pañcāśat, SK. 46.

5. Na vinā bhāvairliṅgaṁ, na vinā liṅgena bhāvanirvṛttiḥ
Liṅgākhyo bhāvākhyastasmād-dvididhaḥ pravartate
sargaḥ, SK., 52;

Na vinā iti liṅgaṁ iti tanmātrasargamupalakṣayati
bhāvaiḥ iti ca pratyayasargaṁ, Ibid. (comm.)

In the Sāṃkhya view, Prakṛti, even being non-sentient, behaves like the sentient principle due to its association with Puruṣa (Self).¹ Similarly, in the Jaina view Pudgaladravya (material substance), even being non-living, behaves like the living principle, when it undergoes modification into the form of Karma by its association with Soul. The Jainas have admitted the union of the worldly soul and the non-living objects, such as, body, etc., like the union of milk and water. In the same manner the Sāṃkhya accepts the union of Puruṣa (Self) and the non-living object, such as, body, senses, intellect, etc., like the union of milk and water.²

Bhāvakarma of Jaina philosophy compares well with bhāva (disposition)³ of the Sāṃkhya and Vṛtti⁴ of the Yoga, and Dravyakarma or kārmaṇaśarīra with the liṅga-śarīra of the Sāṃkhya. Both the Jaina and Sāṃkhya systems of thought do not admit any such cause as God in karmaphala (fruition of action) and karmaniṣpatti (consumption or performance of action). According to Jaina philosophy, Soul is not really the forms—man, animal, god, infernal being, etc., but the soul-supported karmic body, having gone to different places of birth, builds up the forms of beings, such as, man, god, infernal

1. Mātharavṛtti, pp. 9, 13, 33.

2. Asti puruṣaḥ saṃghātaparārthatvāt yataḥ saṃghātaśca parārthaḥ tasmāt hetoḥ iha loke ye saṃghātāste parārthā drṣṭāḥ paryankarathaśaraṇādayaḥ evaṃ gātrāṇām mahadā-dīnām saṃghātaḥ samudāya parārtha eva, etc., Māthara-vṛtti, 17, p. 29.

3. Sāṃkhyakārikā, 40.

4. Rūpādiṣu pañcanāmālocanamātramīṣyate vṛttiḥ vacanādānaviharaṇotsargānandāśca pañcānām, 28
Svālakṣaṇyām vṛttistrayasya saiṣā bhavatyasāmānyā
Sāmānyakaraṇavṛttiḥ prāṇādyā vāyavaḥ pañca, 29
Yugapaccatuṣṭayasya tu vṛttiḥ kramaśca tasya nidriṣṭā
Drṣṭe tathāpyadrṣṭe trayasya tatpūrvikā vṛttiḥ—
Ibid 30

being, etc. In the Sāṃkhya view also the *lingaśarīra* being Soul-supported (*puruṣādhiṣṭhita*), makes *bhūtasarga* (material evolution or creation), such as, man, god, lower animals, etc.¹

THE BUDDHIST VIEW ON THE NATURE OF KARMA

As in Jaina metaphysics, so in the Buddhist philosophy also it has been accepted that the multifariousness of beings is caused by Karma (action).² Like the Jainas the Buddhists also admit *lobha* (*rāga* = greed-attachment), *dveṣa* (aversion) and *moha* (delusion) as the cause of the production of Karma. The being, having been associated with attachment, aversion and delusion, makes mental, vocal and bodily activities and generates attachment, hatred and delusion respectively. Thus the wheel of the world is moving on,³ there is no beginning time of this wheel; it is beginningless.⁴ In reply to the question of King Milinda on the location of the existence of Karma (action) Ācārya Nāgasena has explained that it cannot be shown where does Karma exist.⁵ In the *Visuddhimagga* Karma has been called *arūpī* (non-corporeal),⁶ but in the *Abhidharmakośa* as *Avijñapti*, i. e. Karma has been described as *rūpa* (Matter),⁷ and this *rūpa* (Matter) is *apratigha* (non-

1. *Māṭharakārikā*, 40, 44, 53.

2. *Bhāsitaṃ petam Mahārāja ! Bhagavatā kammassakā māṇava, sattā, kammadāyādā, kammayonī kammabandhū, kammaṇṇasaraṇā, kammaṃ satte vibhajati, yadidaṃ hīnapaṇṇatāyāti, Milindapañho—*, 3, 2;
Karmajaṃ lokavaicitryaṃ—*Abh. K.*, 4, 1.

3. *Anguttaranikāya*, *Tikanipāta Sūtra*, 33, 1, *Bhāga*, 1, p. 134.

4. *Saṃyuttanikāya*, 15, 5, 6 (*Bhāga* 2, pp. 181-2)

5. *Na sakkā Mahārāja ! tāni kammāṇi dessetuṃ idha vā idha iva tāni kammāṇi tiṭṭhantīti—Milindapañho*, 3, 15, p. 75.

6. *Ninth Oriental Conference*, p. 620

7. *Abhidharmakośa*, *K.*, 1, 11.

resisting or penetrable) but not *sapratigha* (resisting or impenetrable). In the *Sautrāntika* view, *saṃāveśa* (inclusion) of Karma is made in *arūpa* (non-matter); it does not accept *Avijñapti* (unmanifested matter). From this it is known that like the Jainas the Buddhists also admit Karma as subtle (*sūkṣma*). Mental, vocal and physical activities also are called Karma. But they are *viññaptirūpa* (instimation-like) or perceptible. That is, here the meaning of Karma is not only perceptible activity, but also is *saṃskāra* (force) born of perceptible action. In the Buddhist definition it is called *Vāsanā* and *Avijñapti*. *saṃskāra* produced by mental activity is called *Vāsanā* (desire) and *saṃskāra-karma* produced by vocal and physical activities is *Avijñapti* (unmanifested matter).¹

If compared, it can be said that the causative attachment, aversion and delusion of Karma of the Buddhists are *Bhāva-karma* of the Jainas. The perceptible action of mind, speech and body is *yoga* (activity) of Jaina philosophy and *Vāsanā* born of this perceptible action and *Avijñapti* are *Dravyakarma*.

The *Vijñānavādin* Buddhists determine Karma by the word 'Vāsanā'. *Prajñākara* opines that whatever *kāryas* (effects or actions) are there, all of them are born of *Vāsanā* (desire). It is the root of all these, whether God or Karma, *Prakṛti* or anything else. Having accepted just God, if the production of the varieties of the universe is caused, even then it would not do without admitting *Vāsanā*. That is to say, the currents of all these rivers like God, *Prakṛti* and Karma become one by uniting into the sea of *Vāsanā*.²

1. *Abhidharmakośa*, 4; Keith's *Buddhist Philosophy*, p. 203.

2. *Kāryatvāt sakalaṃ kāryaṃ vāsanābalasambhavaṃ*
Kumbhakārādikāryaṃ vā svapnadarśanakāryavat.
Pradhānamīśvaraḥ karma yadanyadapi kalpyate
Vāsanāsaṅgasarṃmūdhacetaḥ prasyanda eva saḥ.
Pradhānānāṃ pradhānaṃ tad-īśvarānāṃ tathesvaraṃ
Sarvasya jagataḥ kartrī devatā vāsanā parā. ;
Aśakyamanyathā kartumatra śaktiḥ kathaṃ matā
Vāsanābalataḥ so'pi tasmādevaṃ pravartate

In the view of the Śūnyavādins the other name of Māyā (Illusion) or Anādi Avidyā (Beginningless Ignorance) is Vāsanā.¹ In the Vedantic view also the cause of multifariousness of the universe is the beginningless Ignorance or Illusion.²

THE MĪMĀNSAKA VIEW ON THE NATURE OF KARMA

The Mīmāṃsakas admit the existence of an entity named Apūrva³ which is born of actions like sacrifices, etc. Their argument is this that whatever performance is made by man becomes momentary because of its being action-like. Hence

Iti pradhāneśvarakartṛvādānadyaḥ sadā śīghravahāḥ
pravṛttīḥ Viśantya evādvayatam prayānti tadvāsanāmeḥ
a samudrameva, Pramāṇavārtikālankāra,

A. M., 4, p. 75;

Vide, Nyāyavatāravārtika-Vṛtti, pp. 177-8, Tippan.

1. Sarvajñasyeśvarasyātmabhūte ivāvidyākālpīte nāmarūpe
tattvānyatvābhyāmanirvacanīye saṃsāraprapaṇcibijabhūte
sarvajñasveśvarasyābhilapyete, tābhyāmanyaḥ sarvajñāḥ
īśvaraḥ—SBhā., 2. 1. 14.
2. Tadevaṃ avidyātmakopādhiparicchedāpekṣameveśvarasye-
śvaratvaṃ, sarvajñatvaṃ sarvaśaktimattvaṃ ca, na
paramārthatato vidyāpāṣṭasarpopādhisvarūpe ātmanīṣṭrīṣi-
tavyasarvajñatvādivyavahāra upapadyate, SBhā., 2. 1. 14.
3. Apūrva punarasti yata ārambhaḥ śīṣyate “Svargakāmo
yajeteti” itarathā hi vidhānamanarthakam syāt, bhaṅgitvāt
yāgasya yadyanyadanutpādyā yāgo vinasīyet phalamasati
nimitte na syāt tasmādutpādayatIti, Śābara Bhāṣya, 2. 1. 5;
Phalāya vihitam karma kṣaṇikam cirabhāvine
Tatsiddhirnānyathetyevamapūrvaṃ pratigamyate—
Tantravārtika, 2. 1. 5;
Evaṃ—yāgāderapūrvasvargādisādhanasāktikalpanamūhanī-
yam—Śāstradīpika, p. 80;
Vide Nyāyavatāravārtika-vṛtti, p. 179.

there takes place the birth of an entity called 'Apūrva' out of that performance, which gives the fruit of actions like sacrifice, etc. Kumārila, while explaining this entity—Apūrva, said that the meaning of Apūrva is capacity. Both the actions, such as, sacrifice, etc., and Puruṣa are incapable of producing the heaven-like fruit until the performance of actions like sacrifices, etc., is not made. But after the performance there is born such a capacity by which the doer attains the heaven-like fruit. In this regard an eagerness should not be made to know whether this capacity is of Puruṣa or of the sacrifice. This much is sufficient to know that it is born.¹ That which is called by other philosophers as Saṃskāra (force), capacity, capability and power is expressed by the Mīmāṃsakas with the application of the word 'Apūrvā'. But they accept this view certainly that the emergence of Saṃskāra or Śakti (capacity or power) which takes place from Karma as laid down in the Vedas should be called Apūrva, but Saṃskāra born of other Karma is not Apūrva.²

The Mīmāṃsakas also maintain³ that the substratum (or abode) of Apūrva is Soul and Apūrva also is non-corporeal like Soul.⁴ This Apūrva of the Mīmāṃsakas can be compared with Bhāvakarma of the Jains from this point of view that both of them are non-corporeal.⁵ Bhāvakarma, even being born of Dravyakarma, is the character of Soul. Just as the Mīmāṃsakas have accepted action as non-different from Soul,

1. Karmabhyah prāgayogasya karmaṇah puruṣasya vā
Yogyatā śāstragamyā yā parā sā apūrvamiṣyate—

Tantravārtika, 2. 1. 5.

2. Yadi hi anāhitasaṃskārā eva yāgā naśyeyuh,

Tantravārtika, p. 396.

3. Ibid., p. 398; Kriyātmanoratyantabhedābhāvāt,

Śāstradīpikā, p. 80;

Yadi śvasamavetaiva śaktiriṣyeta karmaṇām tadvinēśo tato
na syāt kartṛsthā tu na naśyati, Ibid.

4. Tantravārtika, p. 398.

5. Nyāyāvatāravārtika, Tippan, p. 781.

just so the Jainas also have accepted Dravyakarma somehow non-different; just as the Mīmāṃsakas regard Apūrva as being born of karma, just so the Jainas also admit Bhāvakarma as being born of Dravyakarma; just as the Mīmāṃsakas accept Apūrva as capable of producing fruit, just so the Jainas accept Bhāvakarma as the producer of particular fruit.¹

But, in fact, Apūrva is in the place of Dravyakarma of the Jainas. The Mīmāṃsakas accept the following order : Karma (action like sacrifices, etc.) is produced from kāmanā (desire) and Apūrva is born of pravṛtti (action), such as, sacrifices, etc. Hence kāmanā or tṛṣṇā (thirst) can be called Bhāvakarma, pravṛtti like sacrifice, etc., as yoga (activity) of the Jainas, and Apūrva as Dravyakarma respectively. Moreover, according to the Mīmāṃsakas, Apūrva is an independent entity. So it seems proper that Apūrva should be accepted in the place of Dravyakarma. Although Dravyakarma is not non-corporeal; nevertheless, it is intangible to the senses just as Apūrva is.

Kumārila also does not make any earnestness in regard to this Apūrva. He has supported it in order to prove the fruit of sacrifice, but he himself has caused the production of the fruit of action without Apūrva. He says that the fruit is produced by action as subtle power or capacity. The production of any effect does not take place all of a sudden. But it becomes manifest as gross form, after becoming finest, finer and fine as power or capacity. Just as curd is not formed instantly on the mixture of acidic thing in milk, but it becomes manifest clearly as curd at particular time, having passed through the stages of many kinds of fine forms, just so the fruits of sacrificial actions, such as, heaven, etc., being born in subtle form, become manifest as gross form on the cooking (maturity) of time later on.²

1. Kriyātmanoratyantabhedābhāvāt—Śāstradīpikā, p. 80.

2. Yāgādeva phalaṁ taddhi śaktidvāreṇa siddhyati sūkṣmaśaktiātmakaṁ vā tat phalamevopajāyate—
Tantravārtika, p. 395, Vide Nyāyavātāravārtika
vṛtti, p. 181.

Ācārya Śaṅkara has refuted the conception of this Apūrva of the Mīmāṃsakas or the conception of subtle power or capacity and has proved this thing that God gives the fruit according to action. He has supported the view that the attainment of fruit is not possible from action but from God.¹

The gist of the above discussion on the nature of Karma is this that there is no objection of any philosopher in regard to Bhāvakarma. In the opinion of all philosophers rāga (attachment), dveṣa (aversion) and moha (delusion) as Bhāvakarma or they are the causes of Karma. That which is called Dravyakarma by the Jainas is called Karma by other philosophers. Saṃskāra (force or impression), Vāsanā (desire), Avijñapti (unmanifested matter), Māyā (illusion) and Apūrva (energy) are the different names of it. It has been observed that there is no particular dispute with regard to the entity, although there is the difference of opinions of the philosophers on this point whether Karma is material substance or quality or essential character (dharma) or any other independent substance.²

Kinds of Karma

The divisions of Karma into puṇya and pāpa (virtue and vice), kuśala and akuśala (good and bad), śubha and aśubha (auspicious and inauspicious), dharma and adharma (merit and demerit) are acceptable to all Indian systems of thought. At the initial stage of speculation about Karma there appears to be two divisions of it, viz. puṇya and pāpa (virtue and vice) or śubha and aśubha (auspicious and inauspicious).³ All Indian systems of thought have accepted these two kinds of Karma—puṇya and pāpa as bondage and determined their respective

1. ŚBhā. on BS., 3. 2. 38-41.

2. Ātmamīmāṃsā, Sri Dalsukh Malvania, pp. 95-110

3. Bṛhadāraṇyaka, 3. 1. 13; Praśnopaniṣad, 3.7; Pañcamakarmagrantha from 15; TS., 8. 21; Sāṃkhyakārikā 44; Visuddhimagga, 17. 88; Yogasūtra, 2. 14; Yogabhāṣya. 2. 12; Nyāyamañjarī, p. 472; PPBhā., pp. 637, 643

objectives to be free from both. Therefore, conscientious men have admitted the favourable feeling (*vedanā*) produced from Karma as only pain without having accepted it as pleasure.¹

The two divisions of Karma into *punya* and *pāpa* have been made from the points of view of feeling. Besides, having kept in view for understanding Karma as good and bad, four divisions of it have been made in the Buddhist and Yoga philosophies, viz. *kṛṣṇa* (black), *śukla* (white), *śukla-kṛṣṇa* (white and black) and *aśuklākṛṣṇa* (non-white and non-black).² *Kṛṣṇa* (black) is *pāpa*, *śukla* (white) is *punya*, *śukla-kṛṣṇa* (white and black) is the mixture of *punya* and *pāpa* and *aśuklākṛṣṇa* (non-white and non-black) is none of the two, because this Karma is of only dispassionate persons. The fruit is neither pleasure nor pain. The reason is this that there do not take place *rāga* (attachment) and *dveṣa* (aversion) in it.³

Besides these, the division of Karma has been made from the points of view of *kṛtya* (to be performed), *pākadāna* (ripening oblation) and *pākaphala* (ripening fruit). In the Buddhist *Abhidharma* and *Visuddhimagga* equally⁴ Karma has been divided into four kinds from the point of view of *kṛtya*, four from that of *pākadāna*, and four from that of *pākaphala*, i. e. in all twelve kinds of Karma. But in the *Abhidharma* four more divisions of Karma have been made from the point of view of *pākasthāna* (ripening place). On the basis of these views, in the *Yogadarśana* also⁵ a general discussion is made in regard of Karma but the counting is different from that of the Buddhists.

1. *Paripāmatāpasamṣkāraduḥkhaiguṇavṛttivirodhācca duḥkameva sarvaṃ vivekiṇaḥ*—*Yogasūtra*, 2. 15.

2. *Dīghanikāya*, 3. 1. 2; *Buddhacaryā*, p. 496; *Yogasūtra*, IV. 7

3. *Yogadarśana*, 4. 7.

4. *Abhidhammattha Saṃgraha*, 5. 19; *Visuddhimagga*, 19. 14-16.

5. *Yogasūtra*, 2. 12-14.

In Jaina philosophy Karma is studied from the four points of view, viz. its nature (prakṛti), duration (sthiti), intensity (anubhāga) and quantity (pradeśa).¹ According to its nature, it is classified into eight fundamental species (mūlaprakṛtis), viz. jñānāvaraṇīyakarma (knowledge-obscuring karma), darśanāvaraṇīyakarma (intuition-obscuring karma), vedanīya-karma (feeling-producing karma), mohanīya-karma (deluding karma which obscures the right attitude of soul to faith and conduct), āyus-karma (longevity—determining karma), nāma-karma (body-making or personality—determining karma with its general and special qualities and faculties), gotra-karma (status-determining karma) e. g. family, clan, caste, nationality, social standing, etc., and antarāyākarma (soul's energy-hindering karma). They are divided and sub-divided further into one hundred and fifty eight kinds of karma (i. e. uttaraparakṛtis of eight basic divisions of karma) with regard to various beings.

STUDY OF KARMA FROM DIFFERENT POINTS OF VIEW

Karmas are produced or manifested by consciousness,² for they are transformed into bad position (sthāna), etc., like matters of beings, accumulated as food and collected as physical structure and there arise in one's mind fear and definite intention for killing a being and putting it to death. This Karma is the cause of bondage of soul.

Karmas produce six kinds of state³ in Soul, viz. (1) audayika (the state of soul caused by the unhindered realization of eight karmaparakṛtis, it consists of all accidental attributes of soul), (2) aupāśamika (the state is produced by the suppression of mohanīya-karma, thought it still continues to exist and may

1. BhS., I. 4, 38; Paṇṇavanā, 1st uddesāka and Karmagrantha, 1-6; Gommatasāra, Karmakāṇḍa.
2. Ceyakaḍā kammā kajjaṃti—BhS., 16. 2. 57.
3. Ibid., 17. 1. 594.

be overcome by proper efforts of self control), (3) *pariṇāmika* (the essential state comprising the qualities attributed to the soul in itself—the qualities in which nothing is changed through karma), (4) *kṣāyika* (the state produced as a result of annihilation of karma, in this state liberation is attained), (5) *kṣāyopaśamika* (the mixed state in which some karma is still existing, but some is neutralized and some annihilated. So the existing karma does not realize itself and possesses no intensity), and (6) *sannipātikabhāva* (the state which consists in the coincidence of several states).

Karmakāraṇa¹ (Process of Karma)

Karmic matter (Karma-pudgala) becomes associated with Soul on account of its passions and activities and at certain states of it the passions are completely destroyed, but mental, vocal and bodily activities still continue in causing consequent influx and bondage of Karma, which require some energy of Soul for their origination. There are stated to be four kinds of *karāṇa* (process or organ of energy of soul), viz. *mana-vāk-kāya-* and *karma-karāṇas*. The *karma-karāṇa* is the process of energy by which the karmic-matter undergoes various processes as a result of different conditions of activities. The process of energy have been divided into eight kinds, viz. *bandhana* (the condition of energy responsible for bondage of soul), *saṁkramaṇa* (transformation of one karma into another—the condition of energy responsible for transformation), *udvartanā* (increased realization of karmas—the condition of energy responsible for increased realization), *apavartanā* (decreased realization of karma—the condition of energy responsible for decreased realization), *udīraṇā* (premature realization of karma—the condition of energy responsible for premature realization), *upaśamana* (subsidence—the condition of energy responsible for subsidence), *nidhatti* (the condition that is capable of making karmas incapable of all the processes (*karāṇas*) other than the increased realization and decreased

1. BhS., 6. 1. 230; *Jīva-vīryaṁ bandhanakramaṇādinimittabhūtaṁ karmakaraṇaṁ*, Ibid. (Comm.)

realization, and *nikācanā* (the condition that is responsible for making karmas incapable of all the processes).¹

The process of energy (*karāṇa*) of Karma produces a corresponding karmic process and vice versa. Thus *karāṇa* is explained from the aspects of substance, space, time, life, condition, body, sense-organ, speech, mind, passion, expansion of soul (*samudghāta*), instinct condition of soul (*leśyā*), attitude of mind, sex-passion, act of killing, matter and its colour, taste, smell, touch and figure (*saṁsthāna*).² Here *karāṇa* is the means of action "kriyate anena iti karāṇam."³

THIRD SECTION

LEŚYĀ (CONDITION OF SOUL)

In Jaina philosophy *Leśyā* is conceived as the condition of Soul-physical as well as psychical. So there are stated to be two kinds of *Leśyā*, viz. *Dravyaleśyā* and *Bhāvaleśyā*; the former is physical, while the latter is psychical. In regard to the nature of *Dravyaleśyā*, there are three views, viz. *karmavargaṇā-niṣpanna*, *karmanisyanda* and *yogapariṇāma*. According to the first view, *Leśyādravya* is composed of *karmavargaṇā*; nevertheless, like the karmic body it is different from eight kinds of Karma⁴, such as *Jñānāvaraṇīya* (knowledge-obscuring karma), etc. The contention of the second view is that *Leśyādravya* is the current (or continuity) of binding Karma. Even there being karma in the fourteenth *guṇasthāna* (stage of spiritual development), in the absence of its current (flux) there is the possibility (*upapatti*) of the negation (non-

1. Studies in Jaina Philosophy, p. 254.

2. BhS., 19-9-661.

3. Ibid. (comm.)

4. Uta., ch. 34 (comm.), p. 650.

existence) of Leśyā¹ at the stage of spiritual development. Third view² held by Śrī Haribhadrāsūri and others says that Leśyādravya has been accepted as independent, belonging to yoga-vargaṇā (class of activity).

Bhāvaleśyā is a particular transformation of Soul which is anugata (acquired or brought about) by saṁkleśa (impurity or affliction) and yoga (activity). It is of innumerable kinds, in fact, on account of there being many divisions of saṁkleśa like intense, more intense and most intense; mild, milder and mildest forms, etc. nevertheless, its nature has been shown in the scriptures by making its division into six kinds in brief, viz. kṛṣṇa (black), nīla (blue), kāpota (grey), teja (red), padma (lotus) and śukla (white).³ The karmic matter communicates colours to the life monad, i. e. the psychological phenomena manifest themselves in six condition of Soul. They are the names to represent the conditions of Soul as if six persons want to enjoy the fruit of a Jambu tree. The first person endowed with black leśyā wants to cut the Jambu tree for its fruits without climbing upon it to get them. The second person having blue leśyā says what is the good of cutting the tree and he advises others to cut its branches for the fruits. The third one endowed with grey leśyā says that it is not proper to do so in order to serve the purpose by cutting the small branches. The fourth one having red leśyā proposes to let off the branches and to break the bunches of fruits for enjoyment. The fifth one possessing lotus leśyā says that there is no need of the

1. This view is written by Vādivaitāla Śrī Śāntisūri with the note "Guravastu vyācakṣate", Uttarā, p. 650, vide Fourth Karmagrantha, pariśiṣṭa, 'ka' p. 33.

2. Paṇṇā, pada 13 (comm.), p. 330;
Dravyāṇyetāni yogāntargatānti vicintyatām
Sayogatvena leśyānāmanvayavyatirekataḥ—Loka., Sarga, 3, Sl. 285.

3. BHS. 1. 7. 22; 12. 5. 450. Paṇṇa; 13; Uttarā., 34;
Kiṇhā nīlā kāu, teu pamhā ya sukkā bhavviyarā
Fourth Karmagrantha, Ga., 13, p. 2.

bunches, hence he suggests to take some fruits from them. The sixth person endowed with white leśyā advises that all these thoughts are useless, because the fruits which are needed have fallen on the ground, so their purpose can be served by them.¹

The second example is as follows : Some six persons were going on for plundering wealth. Having reached one village on the way, one of them said, "Let us destroy this village, kill men, animals, birds, whatsoever things are found here and plunder wealth." On hearing this the second person said, "Why should animals, birds, etc., be killed ? Let us kill those men opposing us." The third one said, "Why should the women be killed ? Let us kill the male persons." The fourth one said, "Not all persons, but those who are armed should be killed." The fifth one said, "Why should the armed persons, who are not opposing us, be killed ?" At last the sixth person said, "What is the good by killing somebody ? Take wealth by the means by which it can be stolen, do not kill any body ? It is not justified to plunder wealth on one hand, and to kill its owners on the other hand."²

From these two examples, the nature of Leśyā can clearly be understood. Among the six persons of each example the conditions of souls of the successive persons are found auspicious, more auspicious and most auspicious by order, i. e. the decrease of saṃkleśa and the increase of mildness in pariṇāmas (transformations of soul) are observed here. The division of mankind into six classes on the basis of possession of these six leśyās are as follows. The black are those who are cruel-hearted and kill living beings by violating the vow of non-injury (ahiṃsā), the first of the five great vows of Nirgrantha religion. The blue are those who are engrossed in their passion or sex instinct or greed and transgress the fourth and fifth vows, i. e. continence and non-possession. The grey are those who are

1. Lokaparakāśa, Sarga 3, 363-66, 71.

2. Ibid, Sarga 3, 363-380;

also Āvaśyaka sūtra, Haribhadriyavṛtti, p. 654.

deceitful and stealing others' things by violating the third vow of non-stealing (adattadāna). The red are those who try to control themselves to observe religion, i. e. the lay worshippers. The lotus ones are firm in controlling them, i. e. the professional mendicants, while the white are those who have attained absolute self-control, Jinakalpa like Lord Mahāvīra.¹

According to the above three views regarding the nature of Leśyādravya, the state of existence or nature (sadbhāva) of Bhāvaleśyā should be understood upto the thirteenth stage of spiritual development (guṇasthāna). This postulation is accepted in Gommatasāra² because in this work yoga-pravṛtti (activity) has been called Leśyā. In the Sarvārthasiddhi and in another place of Gommatasāra yoga-pravṛtti tinged by the rise of passions has been called Leśyā.³ Although the becoming of Leśyā upto the tenth stage of spiritual development is found from this state, but it is not contradictory to the previous statement because of being conditional (apekṣa-kṛta). In the previous statement the causative transformations (pariṇāmas) of karma-prakṛti-pradeśa-bandha are described as Leśyā, while in this account the causative transformations of karmasthiti-anubhāga, etc. four bandhas (bondages) are explained as Leśyā, but not only the causative transformation of prakṛti-pradeśabandha. The study of Dravyaleśyā and Bhāvaleśyā with their respective qualities and transformations, etc., has been made in the Jaina Āgamas and the post-agamic

1. BhS., I. 2. 22; 12. 5. 450.

2. Ayadotti chalessāo, suhatiyalessā du desaviradatiye
Tatto sukkā lessā, ajogitṭhāṇaṁ alessā tu—Gommatasāra,
Jivā., 531.

3. Bhāvaleśyā kaṣāyodayarañjitā yoga-pravṛttiriti kṛtvā
audayikītyucyate—Sarvārthasiddhi, ch. II. 6;
Jogapautṭī lessā, kaṣāya udayāṇurañjiyā hoi
Tatto donṇaṁ kajjaṁ baṇḍhacaukkaṁ samuddiṭṭhaṁ—
GS., Jivā., 489.

works in details,¹ e. g. *kṛṣṇaleśyā* is of cloud colour, of bitter taste like that of Nimba,² etc.

As in the Jaina works there is found the discussion on *Leśyā* indicating the differential states or degrees of the impurity and purity of the internal conditions of souls, something like that there³ is found the division of six classes of mendicants in the view of Gośāla Maṅkhaliputra, the Ājivika leader, which has been made on the basis of six colours like black, blue, etc., having taken into account its purity and impurity of karma.

In the *Mahābhārata*⁴ also there is reference to six colours of Soul, which are similar to some extent with regard to the above consideration. Such conception is found in the Yoga philosophy⁵ of Patañjali because here the division of purity and impurity of conditions of souls has been made by classifying Karma into four divisions, viz. *kṛṣṇa* (black), *śukla-kṛṣṇa* (white-black), *śukla* (white) and *aśukla kṛṣṇa* (none of them). "The black is found in villains. The white and black is attainable by outer means of attainment. The accumulation of the latest deposit of karma in this (division) is by means of injury or of benefit to others. The white belongs to those who castigate themselves and recite the sacred texts and practise contemplation. Because this kind of karma is confined to the central organ alone. It does not depend upon outer means and it does not grow as a result of injury to others. The neither-

1. BhS., 1. 7. 22; 12. 5. 450; Paṇṇavanā, 13 *Leśyāpada*, *Āvaśyaka Sūtra*; Lokaprakāśa, Sarga, 3; Gommaṭasāra, *Jivakāṇḍa*, *Gāthās* 506-507; *Leśyāmārganādhikāra*, *Gāthās*, 488-555.

2. BhS., 1. 2. 22; 12. 5. 450.

3. *Chalābhijātiye*—*Dīghanikāya*, *Sāmaññaphala Sutta*, Makkhali Gośālo *tenupasaṃkamim*.

4. Mbh., 12, 286.

5. *Karmaśuklākṛṣṇaṃ Yoginastriavidhamitareṣāṃ*—*Yogasūtra*, IV; see its *Bhāṣya*.

white-nor-black is found in the mendicant-saints (*saṃnyāsin*), whose hindrances have dwindled away, and whose (actual) bodies are their last.”¹

According to Dr. Zimmer, the six types of *Leśyā*, viz. *kṛṣṇaleśyā*, *nīlaleśyā*, *kāpotaleśyā*, *tejoleśyā*, *padmaleśyā* and *śuklaleśyā*, each with its colour, smell, taste, and touch, “fall into three groups of two, each pair corresponding precisely to one of the three *Guṇas* or natural qualities of the classic *Sāṃkhya* and *Vedāntic* writing”. “The Jaina *Leśyā* 1 and 2 are dark; they correspond to the *Guṇa-tamas*, “darkness”. *Leśyā* 3 is smoky grey, while 4 is of red flame; both pertain to fire, and thus correspond to the *Guṇa-rajas* (fire-rajas, red, colour; of *rañj* “to tinge red”, *rakta* “red”. *Leśyā* 5 and 6, finally are clear and luminous, being states of comparative purity, and thus are the Jaina counterparts of the classic *Guṇa Sattva*; “virtue, goodness, excellence, clarity; ideal being; the supreme state of matter.” “In sum, the six Jaina *leśyās* seem to represent some system of archaic prototypes from which the basic elements of the vastly influential later theory of the *Guṇas* was evolved.”²

1. The Harvard Oriental Series, Vol. XVII, p. 305.

2. *Philosophies of India*, pp. 229-230.

FOURTH CHAPTER

ATOMISM

Introduction

The Indian thought on Atomism reflects a stage of the emergence and development of Indian philosophy of a period in the field of metaphysical knowledge, when the daring flight of imagination of the speculative Indian mind with logical nicety went on to search out the basic principle of dissolution and creation of the material universe. In this speculation the Sāṃkhya-Yoga, Vaiśeṣika, Nyāya, Mīmāṃsaka, Bauddha, Vedānta and Jaina systems of thought have attacked the problem from their respective angles of vision and made attempts at the explanation and interpretation of the root cause of Atomism. The Cārvākas¹ have admitted four or five elements of Matter as the basis of creation with a support for Atomism.

The Sāṃkhya-yoga² philosophy has conceived an idea of atom as produced from tanmātra (infra-atomic potential) by advocating Prakṛtivāda (doctrine of Primordial Matter) as the fundamental cause of the material universe. The Nyāya-Vaiśeṣika³ has propounded the atomic theory on the basis of avayava (constituent element) and avayavin (composite whole), so its Atomism is based on Sthiratvavāda (doctrine of permanence)

1. Tattvopaplavasiṃha, p. 1.
2. Sāṃkhyapravacanabhāṣya, Vijñānabhikṣu, ch. 1, sūtra 62; Vyāsabhāṣya on Yogasūtra of Patañjali, pāda IV, sūtra 14, p. 19.
3. Vaiśeṣikadarśana, Kaṇāda, adhyāya IV, āhnika 1, sūtra 1-2; Nyāyadarśana, Gautama, adhyāya IV, āhnika II, sūtra 15; adhyāya II, āhnika 1, sūtra 35, See Vātsyāyanabhāṣya on them.

and avayavavāda (doctrine of constituent elements), while Atomism of the Buddhist schools¹ of thought like the Vaibhāṣika and the Sautrāntika is supported on Kṣaṇikavāda (doctrine of momentariness), as they are the advocates of this doctrine. The Mīmāṃsakas² like Kumārila and Prabhākara and the Vedāntin Madhva³ accepted Atomism on the basis of the atomic theory of the Nyāya-Vaiśeṣika. The Vijñānavādin Buddhists⁴ and the Brahmvādin Vedāntin like Ācārya Śaṅkara⁵, Ācārya Rāmānuja⁶ and others did not admit this Atomism. The Buddhist work 'Vijñaptimātratāsiddhi'⁷ rejected the atomic theory of the Nyāya-Vaiśeṣika system of thought on the ground of constituent parts of atom (avayavas of paramāṇu), while the Vedāntin Ācārya Śaṅkara⁸ refuted Atomism of the Vaiśeṣika by following the foot-steps of the Vijñānavādin Buddhist under the influence of the Sāṃkhya doctrine of Prakṛti, buddhi (intellect), tanmātra (infra-atomic potential), etc. Jaina philosophy has conceived the atomic theory on the basis of destruction and origination of the material world from the standpoint of transformation taking place in it due to external and

1. See Śāṅkarabhāṣya on Brahmasūtra (Vedāntadarśana), adhyāya II, pāda II, sūtra 18, pp. 484-87; Abhidharmadīpa, Vimalamitra p. 65; cf. Abhidharmakośa, Vasubandhu, Kośa II, śloka 22, p. 29; Kośa I, śloka 12, p. 6.
2. Ślokovārtika Kumārila, Śūnyavāda, śloka 261, 262, p. 301, Prabhākara Mīmāṃsā, Prabhākara Bhaṭṭa, pp. 64-65, 67-68.
3. Pūrṇaprajñādarśana, Madhva, pp. 67-68.
4. Bodhicaryāvatāra, Śāntideva, Navama pariccheda, pp. 235-236, 28.
5. Śāṅkarabhāṣya on Brahmasūtra, (Vedāntadarśana), adhyāya II, pāda II, Sūtras 11-17, pp. 459-84.
6. Śrībhāṣya., Rāmānuja, adhyāya II, pāda II sūtra 11-17.
7. Vijñaptimātratāsiddhi, Vasubandhu, Kārikā Viṃsatikā, Vide Nyāyadarśana, Phaṇibhūṣaṇa Tarkavegīśa, fifth part, p. 105.
8. Śāṅkarabhāṣya on Brahmasūtra (Vedāntadarśana), adhyāya II, pāda II, sūtras, 11-47, pp. 459-84.

internal causes and made a synthetic approach to the problem of the atomic theory from the aspects substance, locus time and condition¹ by taking into consideration of all the concepts of atom of other Indian systems of thought.

Denial of Paramāṇuvāda (Atomism) by the Vijñānavādin Buddhists

In his Vijñaptimātratāsiddhi, Vasubandhu made the refutation of the doctrine of Paramāṇu (ultimate atom) in the Viṃśatikā in the following manner: While rejecting the existence of external object of Vaibhāṣikas, he opined by the first kārikā that their admitted external object cannot be called one whole nor many and the aggregate of combined atoms, because paramāṇu is not proved.² In support of his contention why it is not proved, he said in the second kārikā that if having accepted paramāṇu, the combination (or conjunction) of other atoms with it is admitted, the existence of atom is not proved. Those which are the objects of Vijñaptis (pure sensation or general consciousness) have got no existence. He says that rūpa (colour), etc. – the bases of cognition are either one and composite whole (avayavin-rūpa), just as found in the conception of the Vaiśeṣikas, or atomically many, or the combination (aggregate) of atoms. But one does not become the object of Vijñapti (pure sensation or general consciousness), because each and every atom cannot be apprehended from amongst the atoms. Again, the combined

1. Bhagavatt Vyākhyāprajñapti, śataka 25, uddeśaka 4, sūtra 740; śataka 20, uddeśaka 5, sūtra 670; Ācārāṅga Cūrṇi, (Jinadāsagaṇṇī) p. 165; Uttarādhyayanasūtra with Ṭīkā of Kamalasamyama, p. 99.

2. Na tadekaṃ ca anekaṃ viśayaḥ paramāṇuśaḥ
Na ca te saṃhatā yasmāt paramāṇurna siddhyati
Ṣaṭkena yugapat paramāṇoh ṣaḍaṇīśatā
Ṣaṇṇām samānadeśatvāt pṇḍaḥ syādanumātrakaḥ.
Vijñaptimātratāsiddhi, Kārikā Viṃśatikā, Vide Nyāya-
darśana, Fifth Pt. p. 105.

atoms (*saṃghātaparamāṇus*) also do not become the object of *Vijñapti*, for it is not proved that atom is one substance. The question is how it is not proved that atom is one substance. On this point Vasubandhu makes an analysis of atom. Why is there the part of atom? In case it is divisible, then there is no atom. If six atoms, coming from six directions (quarters)—upward and downward and four sides of an intermediate atom, combine with it simultaneously, then *ṣaḍaṃśatā* (six sidedness or six parts) of an atom is admitted, i. e. an atom has got six parts, for there cannot take place the combination of six atoms in one and the same part of that atom simultaneously. The combination of another atom is not possible then and then in that part in which the combination of one atom takes place. So it is admitted that there takes place the combination of those different six atoms in six different parts of that intermediate atom. Then it cannot be called *paramāṇu* (ultimate atom), because that which has no part and which is the finest of all has been admitted as *paramāṇu*.

And if the simultaneous combination of six atoms in the same part of that intermediate atom is admitted, or the combination of other atoms with the atom having no part is admitted, or if the part which is of one atom is of the six atoms, then there being equal parts of all, all will be a lump-atom only (*piṇḍaḥ syādaṇumātrakaḥ*). The lump as a result of combination of seven atoms cannot be gross, so it cannot be visible. This point is untenable. Again, in this condition any kind of lump is not possible, because the combination of other substance with some particular substance in its different parts can only give rise to the grossness of it. But there cannot be any combination of other substance with that which has no different parts. It is admitted for this reason that the grossness of that substance is not possible. Hence an atom is not different from *Vijñāna* (pure sensation); as it is not such, so no external object is proved by any means. Therefore, there is no separate existence of an object of knowledge different from knowledge.

The Kashmirian *Vaiṣṇīkas* say that there does not take

place saṃyoga (conjunction) of atoms because of their being devoid of parts. But after having been combined, their conjunction takes place. Vasubandhu opines that it should be asked from them whether saṃghātaparamāṇu (combined atom) is rather another entity than these atoms. If there does not take place the conjunction of these atoms, then whose conjunction occurs in combination? Again, a mutual conjunction of saṃghātaparamāṇus (combined atoms) also does not come about. It should not be said that a conjunction is not proved due to the cause of partlessness of atoms, for there does not take place also a conjunction of Sāvayava saṃghāta (combination with parts). Therefore, atoms are not one single substance whether a conjunction of atoms be iṣṭa (desired) or not. The oneness (ekatva) of that whose digbhāgabhedā (division of parts of direction) is admitted is untenable. Atom has got other sides (parts) of eastern direction, of downward direction, etc. In this way, there is digbhāgabhedā; then how will the oneness of tadātmakaparamāṇu (identical atom) be reasonable? And if digbhāgabhedā is not admitted, how will there be impenetrability of atom? How will there be combination? On the rise of the sun, how do there take place (fall) the shadow somewhere and the sunshine elsewhere? If other parts are not existing, there is no sunshine. If digbhāgabhedā is not desirable, then how does there occur the covering of one atom by another one? But an atom has no parabhāga (external or outside part) where there takes place the resistance or repulsion (pratighāta) of one atom by another due to the coming into contact and if the resistance or repulsion does not happen, there will be equal spaceness (ākāśatva) of all atoms and all combinations will become only atom, not molecule. If it forms the lump (piṇḍa), then the lump is not anything else than the atoms or is other than it (atom). If the lump is not accepted as different from atoms, then it is proved that they are not of the lump. This idea is imaginary. If atom is saṃghāta (combined) or piṇḍa (lump), then what is good by holding this view, if there is no denial of the characteristics—rūpa, etc.

Therefore, the characteristics like rūpa, etc., cannot be many. When atom has been disproved, then the multiplicity or manifoldness of substance also has become defective with it (atom). But one cannot ascertain rūpa (matter or visibility) as one substance only, for, if an object of sense of vision (eye) is conceived as one substance, then its undivided apprehension will be direct. But the actual experience in life does not say so. Again, the alternative is meant only for the sake of argument, when discrete atom is disproved, then the combined atom (saṃghāta paramāṇu) also becomes automatically disproved and the objectivity of immediate (direct) matters like eye, etc., also is disproved. Only pure sensation or consciousness (Vijñaptimātra) is proved.¹

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1. So'pi parvasamūhatvāt parvāpi svāmśabhedataḥ (86) Aṃśā api tattvato na santītyāha—amśā apyaṇubhedena iti/ amśāḥ parvabhāgāḥ api aṇubhedena paramāṇuso vibhāgena bhidyamānatvāt kalpitā eva, aṇavo'pi na pratyekaṃ paramārthasantaḥ ityāha—soapyanurdigvibhāgataḥ ? diśaṃ pūrvāparadakṣiṇottarādharordhvasvabhāvānāṃ sambandhena vibhāgato nānatvāt ? tadvibhāgabhedādbhidyamānasya paramāṇoḥ śaḍaṃśatā syāt ? dikṣu vā vibhāgāḥ nānadigavasthitā nānārūpāmśāḥ paramāṇoḥ, tato bhedena na tasya svabhāvo ? etc. Viṃśatikārikā-14); Bodhicaryāvatāra, Navama Pariccheda, p. 235. Śatkena yugapadyogātparamāṇoḥ śaḍaṃśatā śaṇṇaṃ samānadeśatvāt piṇḍaḥ syādvāṇumātrakaḥ, Viṃśatikārikā-12. Te'pi, punaraṇīyāmśo bhāgāḥ tathaiva nirūpyamānāḥ nirātmatayā nabhaḥ-svabhāvatāṃ pratipadyante ityāha digvibhāgo'pītyādi—digvibhāgo niraṃśatvādākāśaṃ tena nāstyaṇuḥ ?" (87), Ibid., p. 236; pp. 261, 281.

REFUTATION OF PARAMĀNUVĀDA (ATOMISM) BY THE VEDĀNTISTS— ĀCĀRYA ŚAṆKARA AND OTHERS

Having followed the footsteps of the Vijnānavādin Buddhists, Ācārya Śaṅkara, Rāmānuja and other Vedāntists except Madhva have refuted the atomic theory conceived by the Vaiśeṣikas as the ultimate cause of the Universe in connection with the Vaiśeṣika charge against the Vedāntist view of the Brahman as the ultimate cause of the Universe.

According to the Vaiśeṣika system of thought, the equalities inherent in the substance constituting the cause reappear in the substance constituting the effect, e. g. white cloth is produced from white thread. If the intelligent Brahman is the cause of the Universe, then intelligence must reappear in all the effects-objects in the Universe. But it is not the case; intelligence is not perceived in the objects like jar, cloth, etc. For this reason the Brahman is not the cause of the Universe.

In reply to this Vaiśeṣika charge Ācārya Śaṅkara argues that according to the Vaiśeṣikas, the spherical atoms produce the dyads which are minute and short and triads which are great and long, but not any thing spherical. That is to say, the qualities like white colour, etc., which, inhering in the atoms, produce other qualities like white, etc., in the dyads, but the dimension—sphericity (*parimāṇḍalya*) existing in atom does not produce another sphericity in the dyad. In this way the dyads which are minute and short produce the triads (*tryaṇukas*), tetrads (*caturaṇuka*), etc., which are big and long and not minute and short, i. e. the dimension of *dvaṇuka*—*aṇutva* (smallness) and *hrasvatva* (shortness), does not appear in the triad and tetrad. For this reason the Vaiśeṣika principle, “the quality of cause must also be present in the effect” cannot be accepted in all cases. On this ground, Ācārya Śaṅkara opines that just as the dyad having the minute and short dimension is produced from the atoms having the spherical dimension and the triad having great and long dimension is produced

from the minute and short dyads, just so a non-intelligent Universe (acetana jagat) may spring forth from the intelligent Brahman.¹

'As to the point of the Vaiśeṣikas that the dyad because of being pervaded by another dimensions, *parimāṇḍalya* (sphericity) of atom cannot produce another *parimāṇḍalya* (sphericity) in it (*dvyaṇuka*), i. e. dyads and triads are endowed with qualities opposed in nature to those of the cause (atom), so that qualities of the cause, being over powered, do not appear in the effect, but non-intelligence is not a quality opposed in nature to intelligence, but its very negation. So there is nothing to prevent the Brahman from reproducing its quality of intelligence in the Universe', Ācārya Śaṅkara replies that it is not proper to say that the cases are parallel, for, according to the Vaiśeṣika view, even the effect being started, an atom remains attributeless for a moment during this period, i. e. before getting affected by other atoms. *Parimāṇḍalya* at this moment can produce itself another *parimāṇḍalya* in the effect. That is to say, if the qualities of sphericity and so on, existing in the cause, do not produce corresponding effects, it is the same with intelligence. Endowment with other qualities does not modify the power of originating effects which belongs to sphericity, for it is admitted that the substance produced remains for a moment devoid of qualities, and only after that moment other qualities begin to come into existence.

If it is argued by the Vaiśeṣikas that *parimāṇḍalya* (sphericity), because of being engaged to produce other dimensions—minute, etc., cannot produce kindred dimension in the dyad, then it is also not justified to say because there are other causes in the origin of other forms (dimensions) like *aṇutva* (minuteness) and *hrasvatva* (shortness) and great and long, not sphericity, according to the Vaiśeṣika sūtra. "The origin of other

1. ŚBhā., on BS., II, 2. 11.

forms is due to other causes.¹ So if sphericity, etc., do not produce like-effects, it is due to their own nature. If it is the nature of sphericity, etc., not to produce like-effects, it may be the nature of Brahman to produce an unlike-effect, the non-intelligent world.

As to the Vaiśeṣika argument that on account of being sānnidhya (nearness) of the effect to the cause producing above forms – aṇutva (minuteness), etc. these dimensions can produce that kind of dimension in the dyads, etc., and there being no such nearness to sphericity, it cannot produce such a sphericity in that effect, it is argued by Ācārya Śaṅkara that it is not correct to say so because when a new quality or a substance is produced, then all qualities exist in the cause by equality (samatā) or generality and the relation of inherence (samavāya). That is, “there is also the observed fact that from conjunction there originate substances belonging to a class different from that to which conjunction itself belongs. The doctrine that effects should belong to spring is too wide.”² The fallacious reasoning of the rule “just as the cause is, so the effect is produced” is come across in other place, as for example, the conjunction of thread is the cause of cloth, but the conjunction of thread is quality; cloth is not quality. Such is the Brahman; even being cetana (intelligent). there is no difficulty in the origination of the non-intelligent world.”³

Bhāskara has adopted this interpretation of the Sūtra “Mahaddīrghavadvā hrasva-parimaṇḍalābhyām”. But Rāmānuja and Nimbārka maintain the view that this Sūtra refutes the doctrine of atoms constituting the universal cause. If the atoms are composed of parts, there will arise the fallacy of

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1. Kāraṇabhutvācca VS., VII. 1. 9; Ato viparīttamaṇu, Ibid., 10; Etena dīrghatvahravate vyākhyāte, Ibid., 17.
 2. Sarpīrjatumadhucchiṣṭānāmagnisamyogādadravatvamadbhiḥ sāmānyam—VS., II. 1.6.
 3. Mahaddīrghavadvā hrasvaparimaṇḍalābhyām ŚBhā. on BS., II. 2. 11.

anavasthā (regress ad infinitum); if they are devoid of parts, they cannot explain the production of other evolutes. Therefore, the atomic view is untenable.

Ācārya Śaṅkara next puts forward the atomic theory of the Vaiśeṣikas and refutes it in the following manner : In the Universe the cloths, etc., are sāvayavadravayas (substances having parts). They, existing in themselves by the relation of inherence (or inhering relation), are produced by the assistance of conjunction (saṁyoga) of threads. By this similarity, whatever things are sāvayava are svānugata (existing in themselves), it is accepted that they are produced by the assistance of conjunction. There where further division of avayava (part=thread), and avayavin (whole=cloth) ceases to be, i. e. come to an end, exists an ultimate atom (paramāṇu). Similarly, this world in which hill, sea, etc., are existing is sāvayava and it is endowed with a beginning and an end because of being sāvayava. And the effect (world) should not be devoid of cause, for this reason atom is the cause of the Universe. Such is the view of Kaṇāda, the author of the Vaiśeṣika Sūtra. Having experienced the four Mahābhūtas (gross elements of Matter) in the Universe four kinds of ultimate atoms have been conceived by the Vaiśeṣikas. Because of there being the division of earth, etc., their division takes place up to an ultimate atom and it is called pralaya (dissolution). After that in the beginning of creation motion is produced by Adṛṣṭa (unseen force) first in air-atoms. This motion (kriyā) unites svāśraya-āṇu (inhering atoms) with other atoms. In this way the great material object called vāyu (air) is produced by the order of dyads, etc. Similarly, fire, water, earth and sensed-body are born. Thus the Universe is constituted by atoms.

Ācārya Śaṅkara refutes this atomic theory of the Vaiśeṣikas in the following manner : The conjunction of atoms existing in the state of division at the time of creation cannot take place without motion, for the conjunction is found in thread, etc., as associated with action (kriyāyuktatantu, etc.), i. e. conjunction

cannot take place without action. There must be some cause (nimitta) of action because of there being kārya (effect). If there were no nimitta (efficient cause) the first action would not have taken place. If nimitta is admitted even, there will come up a defect (doṣa), because effort (prayatna), striking and restriking (abhighata), etc., (any such unseen force) are accepted as nimitta of action; there will not be the first action (āद्या karma) in the ultimate atoms due to its impossibility (i. e. negation of Adrṣṭa). The reason is this that the effort—the quality of soul is not possible in that state, for there is the absence of body. When there takes place the conjunction of soul with the reflective mind in the body, then the quality of soul-effort is possible. In this way the solution of drṣṭānimitta (perceived cause) like striking (abhighāta), etc., should be made. Thus only after the creation of the mind, etc., effort, striking etc., are possible, but not before that.

If Adrṣṭa is accepted as nimitta (cause) of the first action, even then one question arises whether that Adrṣṭa is samavāyin (inhering) in soul (i. e. there is the relation of Adrṣṭa with soul) or in atom. By both ways Adrṣṭa can not be nimitta in atoms because Adrṣṭa itself is non-intelligent (or non-conscious), it cannot perform any action by non-intelligent individuality (svatantratā) till it is not established by or associated with (adhiṣṭhita) intelligent soul (cetana). This is said in the Sāṃkhya Philosophy. For this reason such soul in which intelligence is not born is acetana (non-intelligent) in that state. And if Adrṣṭa would be samavāyin in soul, it cannot become nimitta (cause) in atoms, because the relation of Adrṣṭa is with soul, not with atom. If it is argued that there is the relation of atoms with soul which is associated with Adrṣṭa then there will arise the problem of being constancy in the action on account of the relation being constant, for there is no other determinant in pravṛtti (action). Thus there will be the first action in atoms for there being no definite cause of action in the absence of action; there will not be conjunction and in the absence of it there will not be the effects like dyads, etc.

Next, Ācārya Śaṅkara raises the question whether the conjunction of one atom with another atom is *sarvātmaka* (all-embracing), i. e. one whole atom combines with another whole atom, or *ekadeśin* (partial), i. e. one whole atom combines with the part of another atom. If it is *sarvātmaka* there will arise the problem of *anumātratva* (only one atom) because of there being untenability of increase (*upacaya*). If it is *ekadeśin* (partial or partly), then there will arise the problem of *sāva-yavattva* (atom having parts). If it is said that there are imaginary parts of atom, the conjunction will be unreal (non-entity) due to the cause of imaginary objects, because of being *avastu* (non-entity) and the conjunction will not be the cause of object-like effect, and the effect-substances like dyads, etc., will not be produced, if conjunction does not become cause.

Just as in the first stage of creation there does not take place the action in atoms because of there being no production of conjunction due to the absence of *nimitta* (cause), so in the great dissolution also it does not take place in atoms because of there being no production of disjunction, for in that case also no determinant cause is coming forth into perception. *Adṛṣṭa* is also meant for the attainment of enjoyment, pleasure, pain, etc., but not for the attainment of dissolution. Like this the heaven of the *Vaiśeṣika* will not be there in that state on account of the process of dissolution, and the view that the atom is the ultimate cause will be untenable.¹

Ācārya Śaṅkara says that the *Vaiśeṣikas* conceive that the dyad produced from two ultimate atoms is very different from these two atoms, and it maintains the relation of inherence with atoms. But they can not support the causation of atom (*anukāraṇatā*) by such conception because the fallacy of infinite regress arises on account of the sameness (identity) of the mark of causes, e. g. a dyad which inheres in two atoms is different from them and the relation of inherence which is equally different from two atoms must be inherent in them on

1. ŚBhā. on BS. II, 2.16.

account of a second relation of inherence and so on ad infinitum, for the extreme difference of division is same (equal) in both the cases. Like this the relation of that inherence also with other inhering entities will have to be accepted. In this way there will be a fallacy of infinite regress. In reply to this Vaiśeṣika view, Ācārya Śaṅkara argues that the view of the Vaiśeṣikas is not correct in regard to this point. If it is so, i. e. the inherence is eternally present in the entities seen here and before us, saṁyoga (conjunction) also may be stated to be eternally connected with things which are joined together and need not depend upon a further connection (or relation). It will maintain eternal relation with own things which are joined together. For this reason (i. e. for its own companions) there is no necessity of the second relation of inherence. If it is argued that because of there being a second thing, the conjunction depends upon another relation, then inherence also, because of there being a second object, will depend upon other relation. It is also not correct to say that there is no necessity of other relation (samavāya) for conjunction because of its being quality. Both of them are different from the terms they relate, for both of them depend upon the relation and to call one quality and the other non-quality is only found in the Vaiśeṣika doctrine. For this reason, the dyad will not be produced from the two atoms on account of the fallacy of anavasthā (regress ad infinitum). Therefore, the atomic theory of the Vaiśeṣika is untenable.¹

Ācārya Śaṅkara asks the Vaiśeṣikas what kind of nature of atoms do they admit among the following : active nature (pravṛttisvabhāva) or non-active nature (nirvṛttisvabhāva) or both the natures or neither of them. Among these four alternatives the conception of an ultimate atom (paramāṇu) as cause is untenable by any means. If it is said that there is the active nature of an ultimate atom, there will arise the problem of the

1. ŚBhā. on BS., II. 2. 13

Samavāyābhyupagamācca sāmāyādanavasthiteḥ.

negation of dissolution (pralaya) because of there being permanent activity in it. If the non-active nature of ultimate atom is accepted, there will come up the question of negation of creation because of there being permanent inactivity in it. If both the active and non-active natures of ultimate atom are accepted, it cannot be possible simultaneously, for both are contradictory to each other. If neither of them (neither active nor non-active nature of ultimate atoms) is accepted, some operative cause must be admitted, i. e. their activity or non-activity would depend upon an operative cause. And if *Adṛṣṭa* is admitted as the operative cause, the activity will be permanent because of *Adṛṣṭa* being in permanent proximity to atoms. If it is said that *Adṛṣṭa* is not the operative cause, there will be permanent non-activity. For this reason *paramāṇukāraṇavāda* (doctrine of ultimate) as cause is untenable.¹

“The *Vaiśeṣika* assumes that when substances are broken up into parts, a limit is reached beyond which the process of breaking up cannot be continued. The atoms are the limit. They belong to four classes, and are eternal and possess the qualities like colour, etc. These are the originating principles out of which this material universe of colour, form, etc. is constituted. In reply to this *Vaiśeṣika* view *Ācārya Śaṅkara* opines that if atoms have colour, etc., then they are gross and non-permanent. It is found from the daily experience that the things possessing colour, etc., are compared to their causes, gross and non-permanent. A piece of cloth is gross when compared to the threads of which it is made and non-permanent; so the threads are gross compared to the filaments of which they are made. So the atoms possessing colour must be gross and non-eternal compared to their causes. So the *Vaiśeṣika sūtra* “That which exists without having a cause is external”² does not apply to atoms. Secondly, the reason, which the *Vaiśeṣika* gives for the performance of atoms that “if, as

1. ŚBha. on BS., II. 2-14 *Nityameva ca bhāvāt*.

2. *Sadakāraṇavannityam*, VS., VI. 1.1.

causes, they are not permanent, there is no point in referring to the non-eternality of effects,"¹ is not satisfactory. The eternal cause may be Brahman. Again a word need not always imply the existence of the thing implied by the word. The object must be established as existing by other means of knowledge. If ignorance or non-perception of the cause is too wide, we may believe even binary compounds to be eternal, for they produce perceptible effects and are themselves produced by non-perceived atoms. If it is said that non-perception in avidyā² means that atoms cannot be destroyed either by the destruction of the cause or by disintegration and, therefore, they are to be regarded as eternal, we reply that this reasoning applies only to things that come into being as the result of the combination of several substances. Then the things perish when the substances become separate from each other or are themselves destroyed, but the view of the Vedānta is that the destruction of the effect is possible only by a modification in its condition, as solid ghee is destroyed when it is reduced to a liquid condition. So atoms may not be destroyed or disintegrated but may be transformed into a prior non-atomic condition, which is the condition of the being of Brahman."³ Therefore, the atomic theory is untenable.⁴

According to the Vaiśeṣika view, gross earth possesses the four qualities, viz. colour, taste, smell and touch; fine water possesses the three qualities, viz. colour, taste and touch; still finer fire possesses the two qualities, viz. colour and touch, and air, the finest of all, possesses only the quality of touch. In this way these four gross elements of Matter are found in the world. Ācārya Śaṅkara asks the question whether the atoms constituting the four elements possess larger or smaller number

1. Anitya iti viśeṣataḥ pratigedhabhāvaḥ, VS., IV. 1. 4.

2. Paramāṇoranityatvaviśayā sarvāpyanumitiḥ avidyā bhramarūpā ābhāsāprabhavatvāt, VSU., 4. 1. 5.

3. BS., pp. 375-376.

4. ŚBhā on BS., II. 2. 15.

of qualities than their elements in this matter : In both ways the defect will come up, because (1) if it is conceived that atoms are having larger number of qualities, then they will cease to be called paramāṇu because of there being increase in the size of atoms having more qualities. If it is said that there takes place an increase of qualities with an increase of size, then it is not proper to say this, for among the four elements an increase of their size is found with an increase of their qualities. If it is argued that atoms are not endowed with a larger number of qualities, then in order to save the equality of atoms it has to accept that they must have only one quality and in that case the apprehension of touch will not be in fire or that of colour and touch in water, or that of taste, colour and touch in earth will not be found, for the quality of effect is produced from the quality of cause. If all atoms are assumed to be possessed of the four qualities then smell will be found in water, smell and taste in fire, and smell, colour and taste in air. But such is not the case. For this reason the doctrine of ultimate atom (paramāṇu) as cause is unacceptable.¹

Ācārya Śaṅkara says that Pradhānakāraṇavāda (Doctrine of Pradhāna, the Primordial Matter as the ultimate cause of the Universe) has been admitted by Manu and other Vedic scholars on the basis of Satkāryavāda, etc., but no gentleman has accepted Paramāṇu-kāraṇavāda (Doctrine of atom as the ultimate cause) on the basis of division. For this reason it is absolutely disregarded by the advocates of the Vedas.

He opines that there cannot take place the conjunction of the three entities—atoms, soul and mind because of there being no parts of them. That is to say, atoms cannot enter into saṁyoga (conjunction) with one another and the conjunction of soul with atoms cannot be the cause of the motion of the latter and the conjunction of soul and mind cannot be the cause of cognition because the conjunction of one substance having parts with another having parts is found in experience.

1. ŚBhā on BS., II. 2. 16 (Ubhayathā ca doṣāt).

If it is argued that there is the imaginary parts of atom, of soul and mind, then it is not correct to say so, for any entity will be proved by an imagination of non-existing entity in the world. There is no proof in the making of such rules that "this much imagination (*kalpanā*) only of the existence of non-existing entity, whether illogical or not, should be made, but not an imagination of the existence of an entity more than that. "There is no limit of imagination because of its being independent. As there does not take place a close relationship of the *sāvayava dvyaṇuka* (dyad having two parts) with *niravayava ākāśa* (space or ether without parts), so there does not occur a close relationship of *sāvayava dvyaṇuka* with *niravayava paramāṇu* (atom without parts) also, for there does not take place a combination of *ākāśa* (space or ether) and earth, etc., like lac and stick (*jatukāṣṭhavat*). It is argued that the condition of *āśritāśraya* (the material relation of dependence and substratum) of the effect-substance (*kārya-dravya*) and the cause-substance (*kāraṇa-dravya*) will not be tenable by another method. For this reason inherence must be accepted, then it is also not justified to say because there arises the defect of mutual interdependence (*itaretarāśraya*) in the acceptance of such view of the *Vaiśeṣikas*. There will be an attainment of *itaretarāśraya* by this way of the pot and plum-tree (*kundabadaranyāya*)—the providing of *āśritāśrayabhāva* (relation of dependence and substratum) by *kāryakāraṇa* (effect-cause) and that of *kārya-kāraṇabhāva* (effect-cause relation) by *āśritāśraya-dravyabhāva*. The *Vedānta* does not accept the distinction between effect and cause and admit the relation of dependence and substratum in them, because, according to its view, effect is a kind of condition of cause.

An ultimate atom will be *sāvayava* (possessed of parts) because of being limited on account of there being that much of its parts as whatever number of sides it may have (i. e. six, or eight, or ten); and thus it will be non-eternal for being *sāvayava* (possessed of parts). In this way there will arise the contradiction in the *Vaiśeṣika* doctrine that "there are no parts of atoms.

and they are eternal." If it is argued that the parts which have been conceived in atom by the thought of digbheda (division of direction or relative position) are really atoms, then it is not justified, for atoms also, becoming subtler and subtler up to the cause, can be destroyed, just as earth, because of being very grosser than dvyaṇuka (dyad), etc., and being really in existence even according to the Vaiśeṣika view, can be destroyed. After this earth there may take place the destruction of other fine things of the category of earth, after that there occurs the destruction of the dyad (dvyaṇuka), just so atoms also, being of the category of earth should be destroyed.

If it is argued that in case there is the destruction of atom, it happens by the division of parts, then it is not justified to say so, for just as hardness of clarified butter is destroyed, just so atom also is destroyed. That is, just as there takes place the division of clarified butter, gold, etc., but they melt by the conjunction of fire, just so when atom also attains the state of paramakāraṇa (last cause), there will be the destruction of its form, etc. And the origination of an effect does not take place by mere conjunction of parts, for there does not occur the conjunction of parts of milk, water, etc. nevertheless, there is the production of effects like curd, ice, etc., respectively out of milk, water, etc. For this reason, the paramāṇukāraṇavāda (Doctrine of atom as ultimate cause) is untenable according to Ācārya Śaṅkara¹. Rāmānuja, Vallabha, Bhāskara, Nimbārka and other Vedāntins also supported the view of Ācārya Śaṅkara by rejecting the atomic theory of the Vaiśeṣikas. But Madhva accepted the conception of atom fully on the basis of the Vaiśeṣika atomic theory.²

ANALYSIS OF ATOMISM

The Indian philosophical schools which have invented, developed and adopted the atomic theory by their speculation

1. SBhā. on BS., II. 2. 17.

2. Pūrṇaprajñādarśana, Madhvaśāstra, pp. 67-8.

may be placed mainly in three groups. The first group is represented by Jaina Metaphysics, the second one by the Vaiśeṣika and Nyāya systems of thought and the Bhāṣya (commentary) on the latter by Vātsyāyana and the Vaibhāṣikas and Sautrāntikas of the Buddhist Philosophy, and the last group of Indian Atomism is represented by Praśastapāda's Bhāṣya which is the oldest systematic exposition of the Vaiśeṣika school of thought and generally adopted by the combined Vaiśeṣika-Nyāya philosophy. As pointed out, the Mīmāṃsakas¹ and the Vedāntin Madhva² accepted the atomic theory on the basis of the Vaiśeṣika conception of it, while the Sāṃkhya-Yoga conceived the idea of atom as generated from tanmātra (infra-atomic-potential).

It appears that the speculation about Indian Atomism marks a stage of emergence and development of subtle thought in the field of Indian philosophy in different ages. It has developed from a simpler concept by gradual modifications of scientific thoughts accumulated in successive ages. Thus it has undergone gradual changes with the passage of time.

The seed of Atomism of the Jainas is embodied in the Jaina Āgamas³. Umāsvāti has sown the metaphysical aspect of it in his work Tattvārthādhigama Sūtra⁴ on the basis of the āgamic conception of Atomism Siddhasena Gaṇin,⁵ Ācārya Pūjya-

1. Ślokavārtikā, Kumārila, Śūnyavāda, śloka, 261, 262, p. 301; Prabhākara Mīmāṃsā, pp. 64-65; 67-68.

2. Pūrṇaprajñādarśana, Madhva, pp. 67-68.

3. Bhagavati Vyākhyāprajñapti, 14. 1. 513 (see its Ṭīkā); 20. 6. 670, etc.

4. Tattvārthādhigama Sūtra, Umāsvāti, prathama vibhāga, first edition, 1926, ch. V, sūtras 11. 14, 25, 26, 27, 29, 32, 33, 34, 35, 36.

5. Ibid. (Bhāṣya-Ṭīkā)

pāda,¹ Ācārya Akalaṅka², Vidyānanda,³ Haribhadra Sūri⁴, Vinayavijaya⁵ and other later Jainācāryas gradually developed it on a more scientific basis. They organized the entire system of dispute on Ārambhavāda (Doctrine of Intransitive Causation) of the Nyāya Vaiśeṣika and Kṣaṇika-paramāṇuvāda (Doctrine of momentary atom) of the Buddhists and those of other Indian schools of thought in their respective works.

The Jaina thinkers have retained the Buddhist tradition of of skandha (molecule), while discarding the Nyāya-Vaiśeṣika view of Avayava-Avayavivāda (Doctrine of constituent part and composite whole) in formulating their concept of paramāṇu (ultimate atom). It appears to have originated from the most primitive ideas about Matter. In Jaina Philosophy Matter (Pudgala) is conceived as an eternal substance undetermined from the point of view of transformation of its quantity and quality. Material particles may combine into one substance and one material substance may disintegrate into many. Every material entity of the cosmic universe is constituted of atoms.

The Nyāya-Vaiśeṣika holds the view that paramāṇu is an ultimate cause of the material world (tadantyaṃ kāraṇaṃ)⁶, but not the effect (kārya), it is the root cause of the elements

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1. Sarvārthasiddhi, Āc. Pūjyapāda, āvṛtti, I, ch. V, sūtras 11, 14, 25, 26, 27, 30, 33, 35, 36, 37.
 2. Tattvārtha Rājavārtika, Akalaṅkadeva, Bhāga II, ch. V, Sūtra 11. 14, 25, 26, 27, 30, 33, 36, 37.
 3. Tattvārtha Śloka-vārtika, Vidyānanda, ch. V, sūtras-11, 14, 24, 25, 26, 27, 30, 33, 34, 36, 37.
 4. Haribhadriyavṛtti on Tattvārthādhigama Sūtra, ch. V, sūtras, 11, 24, 25, 26, 27, 29, 32, 33, 34, 35, 36.
 5. Lokaprakāśa Vinayavijaya Gaṇin, part-I, sarga 1, śloka 21, p. 5.
 6. Vaiśeṣikadarśana, Kaṇāda, adhyāya, VI, āhnikā, I, sūtra 1,2; Nyāyavārtika, Udyotakara, adhyāya IV, āhnikā I, sūtra 21.

of Matter. Jaina Philosophy maintains that paramāṇu is both cause (kāraṇa) and effect (kārya)¹ of the material world from the standpoint of transformation which takes place in the elements of Matter, due to external and internal causes. The Jaina conception of paramāṇu as cause and effect is paralled to the conception of energy and consequence of energy of the physical sciences.² In the Sāṃkhya-Yoga Philosophy the material existence of paramāṇu is accepted but not as an unit of matter and an ultimate cause of the material universe as it is conceived in the Nyāya-Vaiśeṣika and Jaina systems of thought. It is a produced entity (Janya padārtha) but not an eternal entity. It is evolved out of the first tanmātra (infra-atomic potential).³

A paramāṇu represents a smallest homogeneous part of any substance. As it is not partless, so it is divisible.⁴ This is the radical difference between the atomicity of matter of the Sāṃkhya-Yoga and the atomicity of matter of the Nyāya-Vaiśeṣika and Jaina Philosophies as embodied in their respective works.

According to the Jainas, paramāṇu is ekānta (discrete) and beginningless,⁵ while a skandha (molecule) is not a

1. Tattvārthadhigama Sūtra, Umāsvāti, prathama vibhāga, ch. V, sūtras 26-27; see its Bhāṣya and Ṭīkā; comm. on the Bhagavati Vyākhyāprajñapti, 14. 4. 510; Tattvārtha Rājavārtika, Akalaṅka, pp. 491-92.
2. Atomic Physics, Harnwell and Stephens. p. 4.
3. Sāṃkhyapravacanabhāṣya, Vijñānabhikṣu, ch. I, sūtra 62; Vyāsabhāṣya on Yogasūtra of Patañjali, pāda IV, sūtra 14, pp. 191-3.
4. Yogasūtra, Patañjali, pāda III, sūtra 52, see Vyāsabhāṣya on it, p. 174; Tattvavaiśāradi, Vācaspati Miśra, p. 174.
5. Bhagavati Vyākhyāprajñapti, 1. 4. 21; 5. 7. 214-15; Anuyogadvārasūtra with Ṭīkā of Maladhari Hemacandra, sūtra 91. p. 69; Uttarādhyayanasūtra, part, IV, adhyayana, 36, vv. 11, 12, 13, (see Ṭīkā on them).

single unit and beginningless. A paramāṇu is in saṃyoga (combination) and it is always undergoing change from the points of view of substance, locus, time and condition,¹ Paramāṇus are infinite in number with regard to substance, a paramāṇu is a finest particle of matter from the point of view of locus, it is momentary from that of time and its capacity of quality is changing from the standpoint of condition.²

The Nyāya-Vaiśeṣika philosophy conceives the indivisibility of paramāṇu³, while the Buddhists⁴—the Vaibhāṣikas and the Sautrāntikas maintain the divisibility of paramāṇu (i. e. Saṃghāta paramāṇu). which consists of, at least, eight parts of elements (aṣṭadravyaka)⁵ of Rūpa (Matter). Jaina philosophy holds the view that sūkṣma paramāṇu (finest ultimate atom) is indivisible, but vyavahāra paramāṇu (usual atom)⁶ and four qualities of paramāṇu, viz. colour, taste, smell and touch, have infinite divisions.⁷ This atomic concept of the Jains suggests the divisibility of paramāṇu without limit like the divisibility of atom the physical sciences. Really speaking, guṇas (qualities) of the Nyāya-Vaiśeṣika, viz. rūpa (colour), rasa (taste), gandha (smell) and sparśa (touch) are paramāṇus of the Buddhists,⁸

1. Bhagavati Vyākṛhāprajñapti, 20. 5. 670; 25. 4. 740; 12. 10. 469.

2. Ibid., 25. 4. 740; 20. 5. 670; Ācārāṅga Cūrṇi, p. 165; Uttarādhyayana Sūtra with Ṭīkā of Kamalasaṃyama, p. 90.

3. Vaiśeṣikadarśana, Kaṇāda, adhyāya IV, āhnikā 1, sūtra 1; adhyāya II, āhnikā I, sūtra, 12.

4. Abhidharmakośa, Vasubandhu, Kośa I, V. 12, Tibetan text, p. 83.

5. Abhidharmakośa, II. 22, p. 29.

6. Anuyogadvāra Sūtra, 133, p. 160; Jambudvīpaprajñapti (pūrvabhāga II, sūtra 19, p. 92). Lokaprakāśa, Vinayavijayaji, part I, sarga I, śloka 21, 28, p. 5.

7. Bhagavati Vyākṛhāprajñapti, 25. 4. 740.

8. Abhidharmakośa, K. I, 10 A, 250 C. D. 65 A. D.

i. e. atoms of quality. Dravyaparamāṇu (material atom) of the Nyāya Vaiśeṣika corresponds to Saṃghātaparamāṇu (combined atom)¹ of the Buddhists, which is divisible by intellect. It can be compared with pañcīkaraṇa of the three guṇas (qualities) of prakṛti of the Sāṃkhya philosophy.² Saṃghātaparamāṇu³ of the Buddhists is avinirbhāgin or abhāga (indistinguishable) from the point of view of vyavahāra (modal standpoint), while paramāṇu of the Jains is anantabhāga (infiniteth part) of paramāṇu of the Nyāya-Vaiśeṣika.⁴ The doctrine of permanence had to be refuted by the Buddhists, so their concept of paramāṇu is that it is divisible by intellect.

The Jaina atomic theory comes nearer to the Buddhist concept of atom from the modal point of view, for, according to Jaina Metaphysics, paramāṇu is non-eternal from the modal point of view.⁵ It is of one class⁶ like the energy of matter of the physical sciences. By convention it may be compared with aṇu (atom) of the Buddhists which is conventionally called atom, as there are stated to be earth-atom, water-atom, air-atom, etc. But they are the forces in the Buddhist convention. Rūpa (colour), rasa (taste), gandha (smell) and sparśa (touch) of Pudgala (Matter) of the Jains compare well with

1. Abhidharmakośa, K. II. 22, p. 29; K. I. 126; K. I. 10 A; Paramāṇu(ṇu)saṃghāta (7) ityārtha ta evāṣṭau cakṣurvijñānadhātāvādayo (hitvā śeṣā daśa) saṃcitā—Abhidharmadīpa, p. 25.
2. Sāṃkhyatattvakaumudī, Kārikā 16, p. 62; Sāṃkhya Kārikā, Kā. 27, p. 17; Sāṃkhyapravacanabhāṣya, ch III, sūtras 11, 12; ch III, sūtra 19, vide The Positive Science of the Ancient Hindus, p. 53.
3. Abhidharmakośa, Vasubandhu, Kośa II, śloka 22, p. 29.
4. Nyāyavārtika, Udyotaka, p. 647.
5. Bhagavati Vyākhyāprajñapti, 14.4. 511.
6. Tattvārthadhigama Sūtra, Umāsvāti, Prathama vibhāga, p. 324.

the Buddhists' guṇas=dharmas (qualities=elements) like rūpa (colour), rasa (taste), etc., i. e. atom of colour, atom of taste, etc. Paramāṇu of the Nyāya-Vaiśeṣika¹ is pūrvaparyāya (previous state or mode) of its own category and also Vijāṭīya-sahakāri nimittakāraṇa (assisting instrumental cause of different kind. Paramāṇu of Jaina Philosophy is beginningless, eternal and non-eternal from the points of view of substance and mode respectively, while paramāṇu of the Buddhists is non-permanent, as the Buddhists Philosophy holds the view that every entity is evanescent according to its doctrine of momentariness. Paramāṇu of the Sāṃkhya-yoga also is non-permanent (anitya) as it is a Janyapadārtha (evolved entity), whereas, paramāṇu of the Nyāya-Vaiśeṣika is beginningless (anādi) and permanent (nitya)² like paramāṇu of Jaina Metaphysics, but it is to be noted that paramāṇu of the latter is also non-permanent (anitya) from the modal point of view.

According to Jaina Philosophy, all sūkṣma paramāṇus are abhedya (impassable or impenetrable), acchedya (uncuttable) avibhājya (indivisible), adāhya (incombustible) and agrāhya (non-receivable)³, while paramāṇu of the Buddhists appears to be bhedya or vibhājya (passable or divisible), for the Buddhist Philosophy advocates the theory of primary and secondary elements of matter.⁴ Paramāṇus of the secondary elements of matter mean varṇa (colour-atom), rasa (taste-atom), gandha (smell-atom) and sparśa (touch-atom), i. e. the Buddhists conceived guṇa (quality) as paramāṇu and made it distinct from citta (mind), because the entire Buddhist system of thought classifies Rūpa (Matter) into two divisions, viz. primary and secondary elements.

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1. Vaiśeṣikadarśana, Kaṇāda, adhyāya IV, āhnik 1, sūtra 1, 3; Nyāyakandālī, Śrīdhara, pp. 78-80.
 2. Vaiśeṣikadarśana, Kaṇāda, adhyāya IV, āhnika, 1, sūtra 1.
 3. Bhagavatī Vyākhyāprajñapti, 20. 5. 670.
 4. Abhidharmakośa, Kośa, 1, śloka 10 A.

That is to say, they represent *dravya* (substance) and *guṇa*, (quality) of the *Nyāya-Vaiśeṣika*. As pointed out, *guṇas* of the *Nyāya-Vaiśeṣika* are made to be *paramāṇu* of the Buddhists, while *guṇas* of the Jainas divide *paramāṇus*. In the *Nyāya-Vaiśeṣika* Philosophy *paramāṇu* is accepted as fine and indivisible, but it appears to be gross when compared with *paramāṇus* of Jaina Metaphysics. This school of thought conceives *paramāṇu* as finest and indivisible, i. e. *sūkṣma paramāṇu* is indivisible, but *vyavahāra paramāṇu*¹ (which can be equated with atom of the physical sciences) is divisible. This is the basic difference between these two atomic theories. The Jaina conception of the nature of *paramāṇu* is by all means different from that of the nature of *paramāṇu* of *Ārambhavāda* (Doctrine of Intransitive causation) of the *Vaiśeṣika* Philosophy. According to Jaina Metaphysics, there are stated to be infinite *paramāṇus*, but there does not exist any radical difference among them like *pṛthivī paramāṇu* (earth-atom), *ap-paramāṇu* (water-atom), *teja-paramāṇu* (fire-atom) and *vāyu-paramāṇu* (air-atom) of the *Vaiśeṣika*.²

A *paramāṇu* of Jaina Philosophy can assume any form in accordance with the causal condition. A *paramāṇu* which has undergone change into the form of earth can undergo transformation, into the forms of water, fire, etc., on the alteration of the material. That is to say, there is no class distinction among *paramāṇus* as conceived in Jaina metaphysics.³ A *paramāṇu* is endowed with one colour, one taste, one smell and two touches and it is known by the mark in the form of its effect (*Kāryaliṅga*).⁴ If a *paramāṇu* is endowed with one

1. *Anuyogadvārasūtra*, 133, p. 160; *Jambudvīpaprājñapti* (*pūrvabhāga*), *sūtra* 19, p. 92 (see their *ṭīkā*s); *Lokaprakāśa*, *Vinayavijaya*ṭī, part. 1, *sarga* 1, *śloka* 21, 28, p. 5.

2. *Vaiśeṣikadarśana*, *adhyāya* IV, *āhnikā* 1, *sūtra* 3.

3. *Tattvārthādhigama sūtra*, *prathama vibhāga*, p. 324.

4. *Ibid.*, ch. V, *sūtra* 25 (*Bhāṣya*), p. 365.

colour, it may be black, or blue, or red, or yellow, or white, if it is possessed of one smell, it may have pleasant smell or unpleasant smell, if it is endowed with one taste, it may have bitter taste, or sour taste, or astringent taste, or acideic taste, or sweet taste; if it is possessed of two touches, it may be cold and cohesive, or cold and dry, or warm and cohesive, or warm and dry.¹

The existence of paramāṇu can be inferred on observation of their collective effect. Even its properties are inferred on observation of the basic properties of Pudgala (Matter). Hence it is inferable by its effect for the persons having common knowledge.² In the same line of thought of Jaina Metaphysics the Nyāya-Vaiśeṣika³ and the physical sciences also account for the existence of atoms in this manner. "Individual atomic events are not observed directly, though their consequence may be and hence greater reliance must be placed on logical inference and methodology than in most other branches of sciences."⁴ "Many of the experimental verification of atomic properties depend on observations of the properties of matter on a large scale. Thus the study of the thermodynamics and the statistical behaviour of large number of atoms, which provides a connection between atomic attributes and the gross properties of matter, is very important."⁵

Jaina Philosophy maintains that the capacities—colour, taste, smell and touch, exist as equal in each and every paramāṇu and can change into any form according to cause. Even though they are equal in all paramāṇus, the variousness of their transformation occurs because of the difference of materials. Similarly, according to the Jaina view, śkaṇḍha (molecule)

1. Bhagavati Vyākhyāprajñapti, 20. 5. 668.

2. Ibid., 18. 8. 640.

3. Nyāyavārtika, p. 233 and its Tātparyatīkā, p. 272, Line 1, from the bottom etc.

4. Atomic Physics, Harnwell and Stephens, p. 4.

5. Ibid.

formed by the combination of paramāṇu is not any new material substance, as it is conceived in the Vaiśeṣika Philosophy. It is only one particular form out of the aggregation of paramāṇus.

In the Vaiśeṣika view paramāṇus are Kūṭasthanityā (absolutely permanent)¹ and this Kūṭasthanityatā (absolute permanence) is proved by all means by maintaining the view that the produced and destroyed substances or quality and action (karma) are different from one another. But Jaina Metaphysics admits pariṇāmanityatā (permanence-in-change) of paramāṇus like the Sāṃkhya by rejecting Kūṭasthanityatā of paramāṇu of the Vaiśeṣika. It conceives all paramāṇus as permanent in their respective individual nature and accounts for their pariṇāmanityatā by accepting skandha (molecule), guṇa (quality) and paryāya (mode), karma (action) as being produced as a result of transformation of paramāṇus.² Thus a skandha is accepted as somehow non-different as well as different from them.

Jaina Philosophy explains all gross and fine material creations (products) on the basis of the capacity of transformation of paramāṇus³ and their combination and dissociation, just as the Sāṃkhya⁴ accounts for the production of the multiforms of the gross and fine material entities of the universe on the ground of differentiated combination of guṇas (qualities)—Sattva (essence), Rajas (energy) and Tamas (inertia or mass) from

1. Vaiśeṣikadarśana, adhyāya IV, āhnika, 1, sūtra 1; Nyāyakandalī, Śrīdhara, pp. 78-80.
2. Bhagavatt Vyākhyāprajñapti, 5.7.213; 14.4.510-11; Tattvārthadhigamasūtra, prathama vibhāga, ch. V. sūtras 26-27.
3. Ibid., 1.9.73; 8.10.356; 25.4. 730; TS., p. 324.
4. TS., p. 324.
5. Sāṃkhyapravacanabhāṣya, Vijñānabhikṣu, ch. 1, sūtra 62, vide; The Positive Sciences of the Ancient Hindus, p. 29; Vyāsabhāṣya on Yogasūtra, Patañjali, pāda IV, sūtra 14, p. 191.

Prakṛti-one Primordial Matter and its capacity of transformation.

The Nyāya-Vaiśeṣika Philosophy stops by conceiving paramāṇu as the sixth part (or division) of rajakaṇa (mote) perceived in the sunrays,¹ whereas Jaina metaphysics accept an aṇu or a paramāṇu (atom) also as skandha (molecule) of infinite sūkṣmaparamāṇus (finest ultimate atoms).² It explains that infinite paramāṇus and infinite skandhas can exist in a subtle form in one point of space, in which one paramāṇu exists, by virtue of its capacity of saṃkoca (contraction or capacity of becoming fine)³, e. g. the combinations of the atoms of mercury and gold in a ratio 1:100 Karśās⁴. On this ground paramāṇu is infinite in number also. It should be noted that it is anardha (without half part), amadhyā (without interior part) and apradeśa (without having parts)⁵ i. e. devoid of void from the point of view of kṣetra (locus). It has neither beginning, nor end, nor middle (i. e. nor interior). It is devoid of length, breadth and depth, because of this fineness it is itself beginning; it is itself middle; it is itself end.⁶ Its fineness compares well with the fineness of Prakṛti of the Sāṃkhya. The difference between the two conceptions lies in the fact that even though Prakṛti is fine, it is one and all-pervading, where as paramāṇus of Jaina Philosophy are infinite in number, but every paramāṇu is finest and smallest, and Lokākāśa or bhautika viśva (cosmic universe) is filled with infinite paramāṇus.

1. Nyāyavārtika, Udyotakara, p. 647.

2. Anuyogadvārasūtra 133, p. 160; Jambudvīpaprājñapti II, sūtra 19, p. 92; Lokaprakāśa, part I, sarga 1, śloka 21, p. 5.

3. Paramāṇukhaṇḍaṣaṭṭrimśikā, Ratnasimhasūri (vṛtti), p. 2.

4. Bhagavati Vyākhyāprajñapti, 13.4. (vṛtti), (Sa. 27), mudrita, pa, 608; Lokaprakāśa, Pt. I, 1, vv. 47-48, p. 88.

5. Bhagavati Vyākhyāprajñapti, 5.7. 215; 20.5. 670.

6. Tattvārtha Rājavārtika, Akalaṅka, Bhāga II, ch. V, sūtra 25; see commentary No. 1, p. 491.

A study of Atomism of all Indian systems of thought reveals that Jaina Philosophy is the advocate of the atomic theory like the Nyāya-Vaiśeṣika. Nevertheless, the nature of paramāṇu conceived in this school of thought is not identical with that of paramāṇu of the Nyāya-Vaiśeṣika. But it compares well with the nature of Prakṛti of the Sāṃkhya, for paramāṇu of this philosophy is transformable like Prakṛti of the Sāṃkhya on this ground paramāṇu of Jainas changes into many forms like earth, water, fire, etc., just as Prakṛti of the Sāṃkhya is the material cause of many effects, such as, earth, water, fire, air, etc. It is not admitted by Jaina Philosophy that the material atoms like earth-atoms, water-atoms, etc., are always basically of different classes. It is to be observed that paramāṇu of the Jainas is finer than paramāṇu of the Nyāya-Vaiśeṣika, but it is unmanifest like Prakṛti of the Sāṃkhya. Anantaparamāṇuvāda (Doctrine of infinite ultimate atoms) of Jaina Philosophy is not far from but nearer to the doctrine of infinite plurality of Prakṛtis of the early Sāṃkhya¹ (with regard to the plurality of puruṣa), i. e. "each being attached to a different puruṣa (self)".²

CONCEPTION OF ATOM IN WESTERN METAPHYSICS AND PHYSICS

The concept of atomicity together with its antithesis continuity was propounded by the Greek philosophers. Atomicity may be roughly described as representing indivisibility, and continuity by divisibility respectively. This early conception of atomicity compares well with the Nyāya-Vaiśeṣika view of

1. Darśana and Cintana, pp. 129-130,
(Jainadharma and Darśana).
2. Yuktidīpikā, p. 169 (Sāṃkhyakārikā Vṛtti), Vide Avidyā,
p. 46.

indivisible atom. Leucippus possibly first propounded the atomic theory "as a means out of Zeno's paradox of the hare and tortoise."¹ About one hundred years later Democritus of Abdera advocated the atomicity of matter. These early Greek philosophers had sown the seed of the concept of atom which gradually developed into a full-fledged atomic theory of modern physical sciences. The convincing proof of the atomicity of matter actually came up about 200 years ago when the natural philosophers observed the fact that "the existence of recognizable substance recoverable from homogeneous mixtures was difficult to reconcile with any theory of the continuity of matter."²

In 1738 it was stated by Daniel Bernoulli that "the behaviour of a gas, as the pressure and temperature were changed, could be explained on the hypothesis that the gas consisted of a larger number of infinitesimal particles in rapid motion."³ The most important evidence for the atomic hypothesis probably was found in the two early chemical laws of definite and multiple proportions which are generally associated with the names of J. L. Prout and J. B. Richter in the later part of the eighteenth century. They are as follows :—

(1) "The proportions in which two elements combine cannot vary continuously, (2) If two elements combine together in more than one way, the mass of an element that combines with a given mass of the other are in simple ratios to one another. The laws are summarised succinctly in the present common notation for chemical formula. But it was not until 1808 that John Dalton marshalled and presented the evidence sufficiently convincingly to say scientific opinion to the acceptance of the atomic theory."⁴

Dalton came to the conclusion from the thought of the way in which various elements unite together to form chemical

1. Atomic Physics, ch. II, p. 40.

2. Ibid.

3. Ibid.

4. Ibid., p. 41.

compounds that every element is constituted of atoms. They are "the indestructible and indivisible units of matter. The atoms of each chemical element are identical but different from atoms of other elements."¹ So, according to Dalton's theory, the number of elementary particles is equal to the number of chemical elements including these produced artificially.

Much simpler and more attractive hypothesis was made by W. Prout in 1816 that "the atoms of all elements are built up of one atom, the atom of hydrogen, which would thus correspond to the prime matter, the ylem of the Greeks. Prout based his idea on the assumption that the atomic weights of all elements were whole numbers and, therefore, multiples of the atomic weight of hydrogen, which is given unit value. This assumption proved to be incorrect when stimulated by Prout's hypothesis; more accurate measurements of atomic weights were carried out and found in many cases to have fractional values, as for example 35.457 for chlorine, or 63.54 for copper. Prout's hypothesis was thus abandoned, but only temporarily, for it was revived in a modified form a century later."²

Prout's atomic theory comes nearer to the Jaina conception of atom which is of one class only. "The discovery of radio activity was mainly responsible for the revival of Prout's theory in a modified form and it has brought the evidence that "the atom is destructible."³

ANALYSIS OF CONCEPT OF PARAMĀNU (ULTIMATE ATOM) FROM THE POINT OF VIEW OF THE DEFINITION OF PUDGALA (MATTER)

Paramāṇupudgala⁴ is called only paramāṇu⁵ or dravya-

1. Atoms and the Universe, p. 28.

2. Ibid., 3. Ibid., pp. 26-27.

4. Bhagavati Vyākhyāprajñapti, 14.4.513; 20.6.670.

5. Ibid., 20. 6. 670; 18. 6. 631.

paramāṇu¹ (atom of material substance). This conception shows the atomic growth of Matter as found in the physical sciences. Paramāṇu is a substance from the point of view or dravya (substance), for it possesses both guṇa (quality) and paryāya;² it is existent in the universe (loka) and non-existent in the non-universe (aloka) and it cannot go there³ from the standpoint of kṣetra (locus or field). Besides, it exists individually in one space-point as a discrete unit of Matter, it occupies one point of space, but it cannot occupy two or more space-points; it can exist together with other paramāṇus in one space-point⁴ by its capacity of saṃkoca (capacity of becoming fine or of contraction). It is traikālika (existing in three points of time—past, present and future) from the aspect of kāla (time)⁵; it is endowed with the properties—colour, taste, smell and touch from the point of view of bhāva (condition),⁶ as these four qualities are called bhāvas (attributes or capacities) of paramāṇu.⁷

With regard to permanency and constancy the quantity of paramāṇu will remain the same as it is for ever⁸ without loss of destruction, increase or decrease in number. No new paramāṇu will be self-generated nor will be produced by anybody. In the past no new paramāṇu was produced, no new one is produced at present and no new one will be produced in future.⁹ Paramāṇu Pudgala abides the principle of 'utpāda-vyayadhrauvyayuktaṃ sat (existence is characterized by

1. Bhagavati Vyākhyāprajñapti, 20. 6. 670.

2. Ibid., 14. 4. 512; 18. 6. 631.

3. Ibid., 2. 10. 121.

4. Paramāṇukhaṇḍaṣaṭṭrimśikā, Ratnasimha Sūri, p. 2; Savārthasiddhi, see the Commentary on ch. V., sūtra 14.

5. Bhagavati Vyākhyāprajñapti, 14. 4. 510.

6. Ibid., 18. 6. 631; 120. 5. 668.

7. Ibid., 20. 5. 670.

8. Ibid., 2. 10. 119; 14. 4. 510.

9. Ibid., 2. 10. 118; Tattvārthādhigama Sūtra, prathama vidhāga, ch. V, sūtra 3; see its auto-auto-commentary, p 322

origination, destruction and permanence)¹. It is existent from the point of view of asti (existence)².

Paramāṇu is transformable with regard to bhāva-guṇa (quality) colour, taste, smell and touch from the standpoint of pariṇāma (transformation).³ There takes place the transformation of four qualities in all paramāṇus, viz. Varnapariṇāma (transformation of colour), rasapariṇāma (transformation of taste), gandhapariṇāma (transformation of smell), and sparśapariṇāma (transformation of touch).⁴ The transformation of shape (saṁsthānapariṇāma) does not occur in the individual independent state of paramāṇu, for it is devoid of shape and it does not assumed any shape in its discrete condition.⁵ In this state paramāṇu undergoes transformation in the form of increase and decrease of its bhāvas (qualities) by combining with another paramāṇu or paramāṇus. There takes place the transformation in the parts of its bhāva-guṇas, i. e. only the natural transformation occurs in paramāṇu existing in its own state. It is agurulaghu (neither heavy nor light) from the point of view of kāya (mass or body).⁶ It is devoid of lump and part; there is no smaller and lighter form of matter than paramāṇu. It is aguru (not-larger or not-heavier) but laghu (lighter) than any material substance. It is agurulaghu in its own state or individual condition from the point of view of bhāva, i. e. there takes place the process of decrease and increase by six steps (sthānas) in its bhāva-guṇas (qualities). It undergoes transformation by six steps with regard to its own qualities, even when it exists in isolation in its discrete condition. As for example, a paramāṇu is one fold black, it can be infinite-fold back by its capacity of agurulaghu-guṇa and again it can

1. Tattvārthādhigamasūtra, prathama vibhāga, ch. v, sūtra 29, p. 374.

2. Ibid., p. 381.

3. Bhagavati Vyākhyāprajñapti, 5. 7, 213; TS., p. 437.

4. Ibid., 8. 10. 356; TS., pt. I. p. 324.

5. Ibid., 8. 10. 356, 357.

6. Ibid., 1. 9. 73.

became onefold black, having attained a decrease in its guṇas (qualities).¹ The process of decrease and increase takes place at every samaya (moment of instant) by the process of natural transformation.

From the point of view of consciousness it is explained that a paramāṇu-pudgala is not jīva (soul) but ajīva (non-soul). In its own state it is not receivable by Soul. In the classification of paramāṇu the fourth class has been called agrāhya (non-receivable).² That is to say, in its own condition it does not come in the service of soul.³ With regard to sacitta and acittadravyas (living and non-living substances), it is acitta (non-living) in its own individual condition because it is non-receivable by soul, i. e. soul cannot exist in a paramāṇu, therefore, it cannot become living. But soul and paramāṇu can exist together in one space-point.⁴

Paramāṇu has its self-existence or individuality (āyā) from the point of view of individual existence and property of Matter. The meaning of the word 'āyā' is not jīvātmā (soul). A paramāṇu has got its own individuality which has been called here āyā (ātmā). It is manifested in its own bhāvas (states or qualities). It can be said that a paramāṇu possesses its independent nature which is different from another one, i. e. each and every paramāṇu is different from every other paramāṇu or paramāṇus. Therefore, a paramāṇu is endowed with one single individuality or discreteness.⁵ This nature of paramāṇu of the Jains is similar to that of paramāṇu of the Nyāya-Vaiśeṣika Philosophy, because, according to the latter, each of paramāṇus possesses its own particularity (antya-viśeṣa).⁶

1. Bhagavati Vyākhyāprajñapti, 25. 3. 730.

2. Ibid., 20. 5. 670.

3. Ibid., 18. 4. 662.

4. Ibid., 13. 4. 484.

5. Ibid., 12. 10. 469.

6. Praśastapādabhāṣya, p. 7.

CONCLUSION WITH A SHORT NOTE ON THE BRĀHMANICAL AND BUDDHIST ATOMIC THEORIES :

The conception of paramāṇu (atom) in the Brāhmaṇical and Buddhist schools has been associated with the theory of the four elements of Matter, viz. earth, water, fire and air. According to this conception, four distinct kinds of atoms correspond to these four elements and their distinctive qualities are inherent in several atoms. This view of the atomic theory has accordingly been accepted by the Brāhmaṇical and Buddhist atomists (i. e. Vaibhāṣikas and Sautrāntikas) on the basis of the atomic growth of elements of Matter, although their opinions differ in details.

The atomic theory is the cardinal tenet of the Vaiśeṣika philosophy.¹ According to its doctrine, "things that exist and are not produced from a cause are eternal; they may be inferred from the fact that all known things are products (effects). Besides, everything perceived is non-eternal, this idea of non-eternality presupposes eternality."² "The uncaused causes

1. Brahmasūtra, II, 2. 11 ff. and Sāṅkarabhāṣya on them.
2. Sadakāraṇavannityaṁ—VS., IV. 1. 1, Pṛthivyādīnāṁ navānāmuddeśaṁ lakṣaṇaparīkṣāṁ nirvartya prakṛtermūlakāraṇatāṁ Sāmukhyābhimatāṁ niracikīrṣuḥ paramāṇunām mūlakāraṇatvaṁ pṛthivyādyantarbhāvaṇa siṣṭadhayīṣurnityāsāmānyalakṣaṇaṁ tāvadāha—
Sadakāraṇavannityaṁ, etc. VS. 4. 1. 1;
Tasya kāryaṁ līṅgaṁ, Ibid., IV. 1. 2;
Tasya paramāṇoḥ kāryaṁ līṅgaṁ, 1. 4. 1. 2;
Tathāca Gautamīyaṁ sūtraṁ—Vyaktāt vyaktasya niṣpattiḥ pratyakṣaprāmāṇyāt—A. 4. 1. ? Avayavāvayavi-prasaṅgastāvanubhūyate sa yadi niravadhiḥ syāt-tadā merusaṣṭapayoḥ parimāṇa bhedo na syāt, anantāvayavārabadhatvāviśeṣat etc, (comm.) 4. 1. 2;
Kāraṇabhāvāt kāryabhāvaḥ—Ibid., IV. 1. 3;

of things constitute ignorance (avidyā)¹ on account of which they are not perceived, hence, they are eternal, or as one cannot conceive any other cause of the decay of an object than the disjunction or destruction of its cause, so it is taken for granted that the last causes must be external. Therefore, these eternal things, the causes of the non-eternal ones, are atoms, but they are intangible to the senses, for only the great thing is perceptible in case it possesses many constituent parts and presupposes colour.² Atom is indivisible, as it is not composed of material parts.³

An object is great, if it is constituted of many constituent parts or if the parts themselves are great, or if they are adjusted in a particular way.⁴ The opposite to Mahat (great thing) is aṇu (small thing)⁵ which is not composed of constituent parts, i. e. atom.

The statement "Great, small, long and short", as popularly used are relative terms, for the same object is great with reference to one object and small in relation to another. These points to great objects because they are visible; there they are applied in a secondary sense. But the expressions 'great' and 'small' are not relative terms in the primary sense, but they signify distinct kinds or general of dimension like red and

Rūpādīnām kāraṇe sadbhāvāt kārye sadbhāvaḥ kāraṇa-
guṇapūrvaka hi kāryaguṇa bhavanti ghaṭapaṭāḍau tathā
darśanādityarthaḥ (comm). 4. 1. 3;

Anitya iti viśeṣataḥ pratiśedhabhāvaḥ, Ibid., IV. 1. 4.

1. Avidyā—VS., IV. 1. 5;

Paramāṇoranityaviṣayā sarvāpyanunitiḥ avidyā bhramarūpā ābhāsaprabhavatvāt, (comm.) 4. 1. 5.

2. Mahatyaneakadravyavattāt rūpāccopalabdi iḥ, VS., IV. 1. 6.

3. Nyāyavārtika, p. 233.

4. Kāraṇabahutvācca, VS. VII. 1. 9;

Mahattvadīrghatva-parimāṇayogābhyupagamāt—ŚBhā on AS., II. 2. 11.

5. Ato viparītaṃ, VS., 7. 1. 10;

Etena dīrghattvagrahṣvatve vyākhyāte, VS., 7. 1. 17.

blue colours, otherwise one would attribute qualities (great or small) to a quality 'greatness' which goes against the principles that qualities are attributeless". Greatness and smallness are non-eternal in non-eternal entities; they are eternal in eternal ones i. e. absolute or infinite. The absolute small 'anu' is spherical in dimension.¹

The qualities like colour, taste, smell and touch in earthen and other material objects disappear on their destruction. But they are eternal in eternal objects like earth-atoms. Similarly, the inherent qualities are eternal in water-atom, fire-atom and air-atom. Some qualities are subject to chemical action (pākaja)² under the influence of heat in earth and earth-atoms. Different atoms come into conjunction.³ In the beginning of creation atoms were set in motion by the unseen force called Adṛṣṭa.⁴ Mind also is atomic⁵ in nature according to the Vaiśeṣika Philosophy. It is to be noted that the word 'Anu' denoting atom is used in the Vaiśeṣika and Nyāya Sūtras, while the word 'Paramānu' (ultimate atom) is come across in the Nyāyavārtika and later works. Besides, the logic for the existence of anu (atom) based on the impossibility of limitless division of an object was not yet applied by Kaṇāda.

In the Nyāya Sūtra and its Bhāṣya written by Vātsyāyana, some aspects of the atomic theory are dealt with on the one hand, while it is defended against the objections raised by the

1. VS., VII. 1. 10-20.

2. Uktā guṇāḥ, VS., VII. 1. 1;

Pṛthivyādirūparasagandhasparśā dravyānityatvādanityāśā
Ibid., VII. 1. 2.,

Etenanityeṣu nityatvamuktaṁ, Ibid., VII. 1. 3;

Apsu tejasi vāyau ca nityā dravyanityatvāt, Ibid., VII. 1. 4;

Anityeṣvanityā dravyanityatvāt, Ibid., VII. 1. 5;

Kāraṇaguṇapūrvakāḥ pṛthivyām pākajaḥ, Ibid., VII. 1. 6.

3. Anusamyogastvapratisiddhaḥ, VS., IV. ii. 4.

4. Agnerurddhajvalanaṁ vāyostiryakpavanamañunām
manasaścādyam karmādṛṣṭakāritaṁ, VS., V. ii. 13.

5. Tadabhāvādanu manaḥ, VS., VII. 1. 23.

opponents on the other hand. Like the Vaiśeṣikas Gautama accepts the physical properties of the atoms as discussed above, for it is incidentally stated by him that the black colour (of earth atoms) is not eternal¹ in spite of its existence from eternity. Hence it can be presumed that the properties of water, fire, and air are considered non-eternal by him.

The metaphysical aspects relating to atoms are dealt with at the end of the analysis of avayavin (composite whole) and avayava (constituent part). It is maintained by the Naiyāyikas² that the composite whole (avayavin) is something different (arthāntara), not separated from its constituent parts, but rather something in addition to them. "Just as a tree as a whole is perceived, though the atoms—the constituent parts of it are imperceptible." An object composed of parts is called avayavin (composite whole) and so also the parts of a part, and so on ad infinitum. The idea of the composite whole cannot be conceived without reaching the last constituent parts (avayavas), hence the idea of the composite whole would lead to nothing. But the limit of division of a material object ends in the indivisible atom.³ This conception of atom compares well with the early Greek idea of atomicity which means indivisibility. If the division of parts is without limit, the mote would not differ in size from the highest mountain, for

1. *Ānuyāmatānityatvabhaddhā*, NS., IV., 1. 67.

2. *Saviṣayānatikrameṇendriyasya paṭumandabhāvādviṣaya-grahaṇasya tathābhāvo naviṣaye pravṛttiḥ* NS., IV. 11. 14;
Avayavāvayaviprasaṅgaiścaivamāpralayāt, NS., IV. 11. 15;
Na pralayo āṇusadbhāvāt, NS., IT. 11. 16.
Param vā truteḥ, NS., IV. 11. 17.

3. *Sarvāgrahaṇamavayavyasiddheḥ* NS., II. 1.35;
Paramāṇusamavasthānam tāvad darśanaviṣayo na bhavatyatīndriyatvādaṇūnām, Ibid., NBhā; NS., II. 1. 36;
Avayavyarthāntarabhūta iti, NBhā., II., 1. 36;
Senāvanavaditi grahaṇamiti cennātīndriyatvādaṇūnām, NS., II. 2. 37.

both of them would possess the same number of parts¹ in that case.

The further development of the atomic theory of the Naiyāyikas is found in the Nyāyavārtika in this manner that a mote in the ray of the sun entering a window is an atom, while some philosophers maintain that atoms do not exist singly (*asamhata*), but always in combination.² This view is apparently of the Buddhists—*Vaibhāṣikas* and *Sautrāntikas* who advocate the idea that atoms are non-eternal, for they are possessed of motion. Like the *Vaiśeṣikas* the *Naiyāyikas* also maintain that atoms are set in motion by the unseen force (*adṛṣṭa*), but they bring God for directing the action of atoms.³

The third stage of the development of the atomic theory is found in the conception of dyad, triad, etc. It was propounded by Udyotakara, subsequently it became the tenet of the Joint Nyāya-Vaiśeṣika works. The union of these two schools of thought began early and became complete at the time of the Nyāyavārtika.

The atomic theory appears to have been embodied into the Buddhist Philosophy by the *Sarvāstivādins* under the influence of their association with the *Vaiśeṣikas*. A frequent mention of atoms is made in the *Mahāvibhāṣā* "in its interpretation of other works and seemingly with no sense of incogruity."⁴

It seems that the atomic theory was prevalent in the early part of the second century A. D., the probable date of the

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1. *Kṛtsnaikadeśāvṛttitvādavayavānāmavayavyābhāvaḥ*, NS., IV. 2. 7; *Teṣu cāvṛtterāvayavyabhāvaḥ* (8); *Prthak cāvayavebhyo āvṛtteḥ* (9); *Na cāvayavyavayavāḥ* (10); *Ekasmin bhedābhāvādbhedaśabdaprayogānupatterapraśnaḥ* (11); *Avayavāntarābhāve'pyavṛtterahetuḥ* (12); *Keśasamūhe taimirikopalabdhivattadupalabdhīḥ* (13) NS., iv. 2.
 2. *Īyāyavārtika*, p. 234.
 3. *PPBhā.*, p. 21.
 4. *A Manual of Buddhist Philosophy*, p. 126.

Mahāvibhāṣā, as evidenced by the fact that the whole theory in its developed form is contained in the *Abhidharma Hṛdaya*.¹ It had an important place in the metaphysics of Vasubandhu and Saṃghabhadra. It was admitted provisionally by the early Yogācārins in spite of their idealism, but it was refuted by the later Yogācārins, beginning with Dinnāga² on the ground that it stood on the path of the doctrine of store-house of consciousness (*ālayavijñāna*), i. e. all phenomena emerge from mind.

A detailed study of the atomic theory as conceived in the North does not seem to have been made by the Neo-Sthaviravādin school established by Buddhaghōṣa, but the use of the *Kalāpa* theory (doctrine corresponding to the concept of *Saṃghātāparamāṇu* of the Sarvāstivādins) was made by Buddhaghōṣa in the *Aṭṭhasālini* and was admitted as an integral part of the Sarvāstivādin Philosophy, the idea being mentioned and considerably developed in the *Abhidhammattha Saṃgaha*. The name 'Paramāṇu' was attributed to the ultimate of molecule; thus the atomic theory is considered to be an integral part of the Sarvāstivādins.³

According to this school, there are stated to be fourteen kinds of atom—five atoms of the five sense-organs, five atoms of the five sense-objects and four atoms of four *Mahābhūtas*. In the *Śāṅkarabhāṣya*⁴ also the atomic theory of the Sarvāstivādins is described in this way : "These Buddhists acknowledge the four elements—earth, water, fire, and wind with their properties and products, including the organs of sense; the four elements are atomic, the earth-atoms have the quality of hardness, the water-atoms that of viscosity, the fire-atoms that

1. It was translated into Chinese in the third Century A.D., Vide *A Manual of Buddhist Philosophy*, p. 126.

2. *Ibid.*, see *Ālambana pratyaya*.

3. *Ibid.*

4. *ŚBhā.* on *BS.*, II. 2. 18.

of heat and the air-atoms that of motion, in combination of these atoms form earthly things, etc.”¹

It is admitted by the Vaibhāṣikas that an atom had six sides, but it is maintained by them that “they made but one or what comes to the same that the space within an atom cannot be divided.” Their view is refuted by the Naiyāyikas in an old verse quoted in the Nyāyavārtika.² Their view that “atoms are ammenable to sense-knowledge, though were not visible apart, just as a dim sighted man sees a mass of hair, though he cannot see a single hair”,³ is also disputed by the Naiyāyikas, according to whom, atom is transcendental and intangible to the sense.

According to the Sautrāntikas, the aggregate of seven atoms is the smallest compound (aṇu)⁴ and the spherical atom did not touch one another completely, but there was an intervening space between them. One thing emerges out of this discussion on the conception of atom that it is indivisible according to all Indian systems of thought, though it is admitted by some that it might be regarded as possessing parts, viz. eight sides. It is maintained by both the Vaibhāṣikas and the Sautrāntikas that atoms are impenetrable.

The atoms of the Buddhist Philosophy are non-eternal; they emerge into being from time to time and then they are destroyed (cf A. K. 12, later half). The ten kinds of atom, i. e. five atoms of the five sense-organs and five atoms of the five sense-objects, are produced due to the four atoms of the four fundamental elements (Mahābhūtas) and they would instantly be destroyed, if there were not the sustaining power of the four elemental atoms.⁵ Therefore, every derivative atom has an

1. Sarvadarśanasamgraha, p. 24, p. 14;

SBhā. II, 2. 18 (BS); see E. R. E., Vol. II, pp. 199-200.

2. Nyāyavārtika, pp. 521-22.

3. E. R. E., Vol. II, p. 201.

4. Abh., D., p. 65, cf. Abh. K., II. 22.

5. Dhṛtyādīkarmasamsiddhaḥ kharasnehogṇaterañāḥ,
Abh., K. 1. 12.

atom of each of the fundamental elements with it for its substance.¹ The atoms of the four fundamental elements of Matter are non-permanent, constantly undergoing change by the process of origination, continuance, decay and destruction followed by a new process of origination, etc. The phenomenalist atomic conception of the Buddhists is in contrary to the substantive theory of atom of the Jaina, Nyāya-Vaiśeṣika and other Indian systems of thought. As regards the antiquity of Atomic theory Jaina Atomism is earlier than Greek Atomism.

1. Abh. K. 4. 29.

FIFTH CHAPTER PROPERTIES OF MATTER

FIRST SECTION GENERAL PROPERTIES OF MATTER

Properties of Matter are the characteristic qualities. According to Jaina Philosophy, Matter is endowed with specific characters of two kinds : those which are inherent in ultimate atoms as well as in aggregates (molecules) and those which are found only in aggregates. It is stated in the Jaina Āgama that Matter is characterized by colour, taste, odour and touch from the points of view of condition (bhāva)¹. They are inherent in ultimate atoms as well as in aggregates of ultimate atoms as the specific properties. In addition to them, an aggregate of two units, or three units, up to that of infinite units of matter is possessed of the physical characters—mutual attraction and repulsion, fineness and grossness, shape and figure, divisibility, opacity and casting of shadows and heat and light energy.² They appear as the manifestations of Matter. On the basis of the āgamic account of them the Post-āgamic works³ explain them in details.

1. Bhāvao vaṇṇamaṁte rasamaṁte gaṁdhamamte phāsamaṁte, Bhs., 2. 10. 118;
Sparsārasagandhavarnavantah pudgalāḥ, TS., V. 23, p. 355.
2. Saukṣmya-sthaulya-saṁsthāna-bheda-tamaśchāyā-tapodyatavantaśca, TS., V. 24, p. 356.
3. Sparsārasagandhavarnavantah pudgalāḥ, TS., V. 23, p. 355;
Sparsaḥ rasaḥ gandhaḥ varṇa ityevam lakṣaṇāḥ pudgalā bhavanti, TS., Bhā., V. 23, p. 355;
Vaṇṇarasagaṁdhaphāsā paramāṇuparuvidā viśesā hi Davvādo ya aṇaṇṇā aṇṇattapagāsagā hoṁti, PS., 57;
Varṇagandharasasparsāmayāścānantā pudgalāḥ,
Vardhamānapurāṇa of Ācārya Sakalakīrti.

In the philosophies like the Vaiśeṣika, etc., the corporeal substances, viz. earth, water, fire and air, have not been accepted as equally endowed with these four specific characters, viz. colour, taste, smell and touch, but it has been admitted that earth is possessed of these four qualities, water is possessed of three qualities without smell, fire is possessed of two qualities—colour and touch without smell and taste, and air is possessed of touch only.¹ Like this they have not accepted four qualities—colour, taste, smell and touch as inherent in mind² according to Jaina philosophy.

For this reason the purport of the sūtra “Sparśarasagandha-varṇavantaḥ pudgalāḥ” is to show the difference of its view from those of the Nyāya-Vaiśeṣika system of thought and others.³ It is indicated by this aphorism that in Jaina philosophy Matter and Soul are different. Therefore, the application of the word “Pudgala” is not meant for Soul.⁴ In this way, earth, water, fire and air are equal as Matters⁵ i. e. all of them are endowed with four qualities. And in Jaina Metaphysics mind also is possessed of these qualities, because of its being material.⁶ It is to be noted that in the physical science also colour, taste, odour and touch have been accepted as the properties of

1. Rūparasagandhasparśavatī prthivī, VS., II. 1. 1;
Rūparasparśavatīāpo dravāḥ snigdhaḥ, Ibid., 2;
Tejo rūpasparśavat, Ibid., 3;
Sparśavān vāyuh, Ibid., 4.
2. Sarvārthasiddhi (comm.), v. 3.
3. Atha sparśādīmantaḥ syuḥ pudgalāḥ iti sūcanāt
Kṣityādijātibhedānām prakalpananirākṛtiḥ,
Tattvārtha Ślo., p. 419.
4. Yasmāditthaṁ lakṣaṇāḥ pudgalā bhavanti tasmānna jīvāḥ
pudgalaśabdavācyaḥ iti / yathā caite paramāṇvādigatāḥ
jīvāḥ sparśādayaḥ guṇāḥ paramāṇvādibhyo bhinnāścā-
bhinnāśca tathā'guṇaparyāyavaddravyaṁ,
TS. Bhā., II, p. 355.
5. TS., p. 415.
6. TS., p. 355.

Matter, just as they are found in Jaina Philosophy. "The colour of a material substance is an important physical property and the apparent colour of a substance depends upon its state of subdivision. The colour becomes lighter as large particles are ground up into smaller ones."¹ "The properties of taste and odour are closely correlated with the chemical nature of substances, and are to be considered as chemical properties."² In regard to touch³ the properties of the material substances like malleability, ductility, hardness, etc., are dealt with in details in the physical science.

Akalaṅka, Vidyānanda and Siddhasena Gaṇin give the reasons why have these four basic properties of Matter been placed in the order of touch, taste, smell and colour respectively in the Tattvārthādhigama Sūtra. Touch is prominent (strong) among all the properties of Matter, because the manifestation of touch in the *spṛṣṭa-grāhī-indriyas* (tactile sense-organs) takes place first and it becomes apprehensible to the worldly beings. For this reason touch has been first accepted among the properties of Matter. According to Jaina Metaphysics, eye is *aprāpyakārī*, i. e. it does not go up to the object; it apprehends its own object from a distance, while the Nyāya Philosophy maintains that eye is *prāpyakārī* i. e. it reaches the object to apprehend it; the Sāṃkhya says that every sense-organ and mind also go up to the object and then apprehend it.

Although among the worldly beings, indifferent to touch, the manifestation of taste (*rasavyāpāra*) is sometimes found prominent in the object; nevertheless, on the touch of it, the manifestation of taste takes place. For this reason taste has been placed after touch because the apprehension of taste occurs after that of touch. In air also taste, colour, etc., are accepted to be inherent, hence there is no fallacy. The properties like colour, etc., are inherent in it. Just as the qualities

1. General Chemistry, Pauling, p. 12

2. Ibid., p. 13.

3. Ibid., p. 12.

like colour etc., even being inherent in the non-apprehended fragrant substance, are intangible because of being unproduced or fine and they are not experienced as becoming a gross object of the sense-organs like eye, etc., so colour, etc., of air also are apprehended by the sense-organs. Smell has been posited before colour because it is imperceptible. Last of all colour has been accepted on the ground that it is experienced as inhering in the gross material substance only.¹

It is further stated in the Āgamas and the post-āgamic works that Matter possesses five colours, five tastes, two smells and eight touches. The numbers of colour, of taste, of smell, and of touch are specifically mentioned in them in the following manner : colour is of five kinds, viz. black, blue, red, yellow and white; taste is of five kinds, viz. bitter, sour, acidic, sweet and astringent; smell is of two kinds, viz. pleasant and unpleasant; and touch is of eight kinds, viz. soft, hard, heavy, light, cold, hot, smooth and rough.² The sub-division of modes of each of these twenty kinds of property of Matter may be one to countable, countless and infinite³ from the standpoint of the relation (state) of degrees. At every samaya (instant) the possible divisions of four qualities among them are found in each and every matter. In other words, every one of them has got one

1. Viṣayabalattvāt sparśagrahaṇamādaḥ, TS., p. 355;
Sparśagrahaṇamādaḥ viṣayabaladarśanāt (1);
Rasaprasaṅga iti cet ; na; sparśe sati tadbhāvāt (2);
Vāyau tadabhāvāt vyabhicāra iti cet; na tatrāpyabhyupagamāt, (3); RV., p. 484;
Rūpāt prāggandhavacanāṁ acākṣuṣatvāt...ante varṇagrahaṇam sthauṛye sati tadupalabdheḥ (5); RV., p. 484;
TS. Śl, p. 419; TS., p. 355.
2. Poggale paṇicavaṇṇe paṇicarase dugamḍhe atṭhaphāse paṇṇatte, Bhs., 12. 5. 450; TS. Bhā., p. 356; SS., p. 356; RV., pp. 484-5.
3. Bhs., 25.4, 739; Anuyogadvāra, p. 110;
Ta ete mūlabhedāḥ pratyekaṁ saṁkhyeyāsaṁkheyānantābhedaśca bhavanti, SS., 5. 23 (Comm.).

to infinitesimal transformations or modifications (states) of degrees. At every samaya (instant) the possible divisions of four qualities among them are found in each and every form of matter. In other words, every one of them has got one to infinitesimal transformations or modifications. As for instance, there are stated to be onefold black, twofold, black, threefold black up to tenfold black, numerablefold black, innumerablefold black and infinitesimal black colour; the accounts of blue, red, yellow and white also should thus be understood. Similarly, those of pleasant and unpleasant smells, of five tastes and of eight touches should be known.

The Jaina conception of five colours of Matter appears to be scientific. Black, blue, red, yellow and white are inherent colours in Matter; they are the basic colours and more scientific and up-to-date, as it is demonstrated by the following statements. "As the temperature of a body is raised, it emits first of all infra-red radiation, then red light, then yellow light, and finally white light. If we could obtain even higher temperatures in the laboratory, we could make bodies 'blue hot', as is actually observed with some of the stars."¹

"As the temperature of a body is raised, the colour emitted by it becomes more and more rich in waves of shorter-wavelength. Some of the stars shine with a bluish white light which indicates that their temperature must be very high."² "The infra-red rays are the dark heat rays which do not generate the sensation of vision. These rays are present in what appears to be perfect darkness to us. The eyes of a cat or of an owl are provided with the infra-red rays, so that these animals can perceive in the dark."³ Now-a-days photographs can be taken in utter darkness with the help of infra-red-rays. "So long as the temperature is below the draper point, 525°C , a body

1. A Text Book of Heat by A. W. Barton, p. 361.

2. Dr. M. N. Saha, F.R.S. and B. N. Srivastava, p. 341,

Vide Cosmology Old and New, p. 166.

3. Cosmology, Old and New, p. 166.

emits only infra-red rays; in other words, it appears dark or black, then the colour changes to red, then white and finally blue."¹

It is to be noted here that these colours are not pigmentary, but natural colours which are assumed by a piece of matter at a different conditions of temperature. Their number is only five, viz. black, red, yellow, white and blue. Hence they are identical with the five kinds of inherent colour of Pudgala (Matter) as conceived in Jaina Philosophy.²

According to some, green should be included in the list of natural colours and black and white are unnecessary, for white is a mixture of green and red pigments and black is the absence of colours. It should be observed here that the above mentioned five colours are not pigmentary. The fundamental colours—red, green, and bluish-violet are needed by a canvas painter to produce a desired colour from them by mixing three powders in different portion, while the three colours—red, yellow and blue are required in tri-colour printing on paper.³

Even it is demonstrated in the case of the colours of solar spectrum that in case "the red light it cut off from the spectrum by an opaque screen and the remaining six colours then recombined by a prism, the resulting light would be green."⁴ That means "what appears to be green is only white light minus red."⁵ Besides, there lies a distinction between a mixture of special colours and that of pigment colours. The mixture of blue and yellow light produces white light, whereas, the mixture of blue and yellow pigments generate a green paint. This demonstrates clearly that the five basic colours of Matter are not special nor pigmentary. The modern definition of

1. Cosmology Old and New, p. 166.

2. Varna sa pañcavidhaḥ kṛṣṇa-nīla-pīta-śukla-lohita bhedaḥ, SS., V. 23.

3. Cosmology Old and New, p. 164.

4. Ibid.

5. Ibid.

colour says, "colour is the general term for all sensations arising from the activity of the retina and its attached nervous mechanism. It may be exemplified by the enumeration of the characteristic instances, such as, red, yellow, blue, black and white."¹

So the five inherent colours of Pudgala (Matter) as conceived in Jaina Metaphysics agree well with the five natural colours of matter of the physical sciences. In regard to the infinite modes of these five colours, they can be compared with the difference of wave lengths, as "the apparent colour of a material substance depends upon its state of sub-divisions, it becomes lighter as large particles are ground up into smaller ones."²

As to the five kinds of taste, viz. bitter, sour, acidic, sweet, and astringent, it can be said that the modern scientific research has demonstrated that there are in the taste only five general classes, viz. sweet, bitter, saltish, sour, and insipid.³ In regard to the division of smell into two kinds, viz. pleasant and unpleasant, there is no controversy in any Metaphysics and Physics. The four parts of the quality of touch (sparśa) or eight divisions of touch (sparśa) of Jaina Philosophy correspond to the following four physical properties of Matter according to the physical sciences—Scale of hardness (mr̥dukaṭhina=soft and hard), density (guru-laghu=heavy and light) temperature (śīta and uṣṇa=cold and warm) and crystalline structure (snigdha-rūkṣa=smooth and rough or cohesive and dry).

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1. Report of the Colorimetry Committee, 1922, Optical Society of America, vide *Cosmology, Old and New* p. 168.
 2. Ibid.
 3. See the article "Taste and Chemical Constitution" by A. J. Mee, M. A., in the *Science Progress*, October, 1934, vide *Cosmology Old and New*, p. 164.

THE SĀMĀKHYA VIEW OF THE PROPERTIES OF MATTER

Dr. B. N. Seal explains that "the properties of a thing are only the energies that are manifested in the particular collocations of the three Guṇas—Mass, Energy and Essence; and a tri-Tanmātric or a penta-Tanmātric atom, i. e. an atom composed of three or five kinds of Tanmātras may differ from another of the same class in respect of the number of constituent Tanmātras of a particular kind, as also of their collocation or grouping, and therefore, in mass as well as in generic and specific characters."¹

According to the Sāmākhya-Pātañjala—the properties (energies) of the substances originate from the grouping or the quanta of the Tanmātras, or the guṇas themselves, e. g. "various kinds of fruit acids and juices, all originating from one and the same Bhūta (water) with different accretions of earthy matters (bhūvikārah)".²

So it is maintained that the four Bhūtas or Mahābhūtas

1. *Yogyatāvaccinnā dharmināḥ śaktireva dharmāḥ*, *Yoga-sūtra*, *Vyāsa-bhāṣya* 3, vide *The Positive Sciences of the Ancient Hindus*, p. 44.
2. *The Positive Sciences of the Ancient Hindus*, p. 45;
Yo...dbarmeṣu anupāti sāmānyaviśeṣātmā so anvayī dharmin, *Yogabhāṣya*, III. 14;
Syādetat—katham ekarūpāṇām guṇānām anekarūpā pravr̥ttiḥ ityata āha pariṇāmataḥ salilavat / yathā hi Vāridavimutaḥ udakaḥ ekarasaḥ api tattadbhūvikārān āsādyā nārikela-tāla tati-vilva-ciravilva-tindukāmalaka-kapittha-phalarasatayāpariṇāmāt madhurāmlalavaṇatiktakaṣāyakaṭutayā vikalpate, evamekaika-guṇasamudbhavāt pradhānam guṇam āśritya apradhānaguṇāḥ pariṇāma-bhedān pravarttayanti / tadidamuktaḥ pratipratiguṇāśraya-viśeṣāt ekaika-guṇāśrayeṇa yo viśeṣastasmāt ityarthāḥ, *Tattvakaumudī*, *Vācaspati on Kārikā*, 16. See : P. S. A. H., pp. 45-6.

(fundamental elements of Matter), viz. air, fire, water and earth, possess the four specific qualities, viz. touch, colour, taste and smell respectively as conceived in the Nyāya-Vaiśeṣika system of thought. The difference between the Sāṃkhya-Yoga and Jaina views regarding these properties is this that they are the specific qualities in the four Bhūtas (fundamental elements) respectively, according to the former, while in the latter's view all of them are inherent in every kind of matter whether it is earth or water or fire or air.

THE NYĀYA-VAIŚEṢIKA VIEW OF THE PROPERTIES OF MATTER

The four general properties of Matter (Pudgala) of Jaina Philosophy, viz. colour, taste, smell and touch, are stated to be the four specific qualities of Matter¹ of the Nyāya-Vaiśeṣika Metaphysics. According to its view, earth possesses colour, taste, smell and touch,² besides number, dimension, conjunction, disjunction, priority, posteriority, weight, fluidity, velocity and elasticity. Smell is the specific quality of earth which differentiates it from other substances. In addition to them, it possesses motion (kriyā)³ which generates velocity (vega),⁴ weight (gurutva)⁵ and fall (patana),⁶ liquidity

1. Rūparasagandhasparśāḥ, VS., 1. 1. 6;
Rūparasagandhasparśā..., PPBhā., p. 38.
2. Rūparasagandhasparśavatī prthivi, VS., II. 1. 1.
3. Nodanābhghātāt saṃyuktasaṃyogācca prthivyām karma, VS., V. 2. 1.
4. Yattu yugapat prakṣiptaśarayorekasya tīvro vego aparasya tu mandaḥ tatra, nodanātīvratvamandatve nimittam, VSU., 5. 1. 17.
5. Saṃskārābhāve gurutvāt patanam, VS., 5. 1. 18.
6. Ibid.

(dravatva)¹ and law of affinity.²

Water is possessed of all the qualities of earth-substance except smell with this distinction that its characteristic is natural.³ Of these colour, taste, touch, natural fluidity and viscosity are the specific qualities of water by which it is differentiated from all other elements of Matter.⁴

Fire is possessed of all the qualities in common with earth and water except taste, smell and weight due to the negation of which it moves upwards, viz. colour, touch, number, dimension, separateness, conjunction, disjunction, priority, posteriority, fluidity and velocity.⁵ Colour and touch are only its distinctive characteristics. Its colour is white and illuminating (bhāsvara) and its touch is hot.⁶ The liquidity in it is not intrinsic, but it is perceived when a strong heat is generated as in the case of all the metals.⁷

1. Sarpirjatumadhūcchiṣṭānāmagnisaṃyogād-dravatvamadbhiḥ sāmānyaṃ, VS., II. 1. 6;
TrapusIsaloharajatasuvarṇānāmagnisaṃyogād-dravatvamadbhiḥ sāmānyaṃ, Ibid., II. 1. 7.
2. Bhūyastvād-gandhavattvācca pṛthivī gandhajñāne prakṛtiḥ, VS., VIII., 2. 5.
3. Rūparasasparśadravatvasnehasaṃkhyāparimāṇapṛthaktvasaṃyogavibhāgaparatvāparatvadravatvasaṃskāravatyah pūrvavaddesāṃ siddhiḥ, PPBhā., p. 91; Āptvābhisambandhādāpaḥ, PPBhā., p. 14.
4. Rūparasasparśavatya'po dravāḥ snigdḥāḥ, VS., II, 1. 2.
5. Tejastvābhisambandhat-tejaḥ, PPBhā., p. 15;
Rūpasparśasaṃkhyāparimāṇapṛthaktvasaṃyogavibhāgaparatvāparatvadravatvasaṃskāravat pūrvavaddesāṃ siddhiḥ tatra śuklaṃ bhāsvaraṇca rūpaṃ uṣṇa eva sparśaḥ, PPBhā., p. 15.
6. Tejo rūpasparśavat, VS., II. 1. 3 ;
Tatra śuklaṃ bhāsvaraṇca rūpaṃ uṣṇa eva sparśaḥ, PPBhā., p. 15.
7. Vyoma, (PPBhā.), pp. 255-60 ; See PPBhā., 25.

Air possesses the characteristics of touch, number, dimension, separateness, conjunction, disjunction, priority, posteriority and velocity¹ in common with earth, water and fire of these touch is the distinctive characteristic of it, which is non-chemical and neither hot nor cold.² This quality differentiates it from earth, water and fire. Air is possessed of oblique or transversal motion (*tiryag-gati*),³ but no weight⁴ in the absence of which it does not come down. Its motion is unimpeded as it receives the impetus from the velocity of air.⁵ The Nyāya-Vaiśeṣika view on the properties of Matter suffers from some defects, when they are analysed in the light of the physical sciences. As for instance, it maintains that air does not possess any weight, but modern physics demonstrates that air also is possessed of weight. In agreement with the physical sciences Jaina Metaphysics holds the view- that air also possesses the quality of weight because of being a form of Matter.

KINDS OF FOUR SPECIFIC QUALITIES OF MATTER IN THE NYĀYA-VAIŚEṢIKA METAPHYSICS

Colour : According to the Nyāya-Vaiśeṣika Philosophy, there are stated to be seven kinds of colour, viz. white, blue or black, yellow, green, grey, red and citra (variegated colour)

1. Sparśavān vāyuh, VS. 11.1.4. Vāyutvābhisambandhādvāyuh sparśasāmkyaparimāṇaprthaktvasaṃyogavibhāgaparatvā-paratvasamskāravān, PPBha., Vāyunirupaṇaprakaraṇam.
2. Sparśasca vāyoḥ, VS., 11.1.9; Sparśo'syānuṣṇāśītatve satyapākajaḥ, guṇa /iniveśātsiddhaḥ, PPBhā., p. 17.
3. Agnerurddhvajvalanaṃ vāyostiryakpavanamaṇūnāṃ manasaścādyam karmādr̥ṣṭakāritaṃ, VS., V. 2. 13.
4. PPBhā., Vāyunirupaṇaprakaraṇam.
5. Preraṇādiheturekaḥ san kriyābhedādapānādisamjñam labhate, Ibid.

belonging naturally to earth.¹ When compared with the five basic colours of Jaina Metaphysics, these seven colours of the former can be reduced to the five colours of the latter, for green, grey and variegated colours are not the original colours of Matter as demonstrated by the physical sciences.

Taste : Taste is of six kinds, viz. sweet, acidic, saltish, bitter, sour and pungent (or astringent) belonging to earth². Here the saltish taste is not the basic taste of Matter according to Jaina Metaphysics. But it is accepted by the science as one of the basic tastes. So there is a difference between the two systems in regard to the basic tastes, but the Jaina view is nearer to that of the physical sciences.

Smell : Like Jaina Philosophy the Nyāya-Vaiśeṣika mentions two kinds of smell, viz. good and bad (i. e. pleasant and unpleasant)³. But according to this philosophy, they belong to earth only, while the Jaina system of thought maintains that they belong to all forms of Matter.

Touch : The Nyāya-Vaiśeṣika maintains that touch⁴

1. Śuklādyaṇekaprakāraṁ salilādīparamāṇuṣu nityaṁ pārthivaparamāṇuṣvagni—saṁyogavirodhi sarvakāryadravyeṣu kāraṇaguṇapūrvakamāśrayavināśādeva vinaśyati, PPBhā., p. 44 ; see NK., p. 30.

The word 'citra' is used for an independent colour (Kiraṇāval of Udayana, p. 205).

2. Raso rasanāgrāhyaḥ pṛthivyudakavṛttiḥ jīvanapuṣṭibalārogyanimittam rasanasahakārī madhurāmlalavaṇatikṭakatukaṣāyabhedabhinnah asyāpi nityānityatvaniṣpattayo rūpavat, PPBhā., Rasaprakaraṇam, p. 45.
3. Gandho ghrāṇagrāhyaḥ pṛthivīvṛttiḥ ghrāṇasahakārī surabhirasuraviśca asyāpi pūrvavadutpattyādayo vyākhyātaḥ, PPBhā., Gandhaprakaraṇam, p. 45.
4. Sparśastvagindriyagrāhyaḥ kṣityudakajvalanapavanavṛttiḥ, Tvakṣahakārī rūpānuvidhāyī śītoṣṇānuṣṇāśītabhedāt trivīdhaḥ asyāpi nityānityatvaniṣpattayaḥ pūrvavat, PPBhā., Sparśaprakaraṇam, p. 45.

belonging to earth is of three kinds, viz. hot, cold and neither hot nor cold, which are generated from chemical action. But the Jaina view is that there are eight kinds of touch which can be grouped into four divisions, as already pointed out, on the basis of their conception in the physical sciences.

These four specific qualities—colour, taste, smell and touch are possessed by both the earthly form of matter—eternal and non-eternal. But they are non-eternal in both the cases because of chemical action, unlike the qualities, belonging to the ultimate atoms of water, fire, and air. The Mīmāṃsaka view on the properties of Matter is the same as they are found in the Nyāya-Vaiśeṣika Philosophy, for its very conception of Matter is based on the Nyāya-Vaiśeṣika doctrine of Matter.

PROPERTIES OF MATTER IN THE BUDDHIST PHILOSOPHY

As previously touched upon, the general property of Matter (Rūpa) conceived in the Buddhist Philosophy is impenetrability (sapratiṅgha), i. e. space occupied by one of the elements of Matter cannot be occupied by another at one and the same time.¹ In Jaina metaphysics paramāṇu (ultimate atom) has been characterized by the property of impenetrability, besides the effects of Matter have been described as ghātaśarīra and aghātaśarīra (obstructive and unobstructive bodies). The ghātaśarīra (obstructive body) offers resistance to causes which tend to produce a change in its position, configuration or

1. Yaṃ taṃ rūpaṃ ajjhatthikaṃ taṃ sappatighaṃ. yaṃ taṃ rūpaṃ bahiraṃ, taṃ atthi sappatighaṃ, atthi appatighaṃ, Dhamma Saṃganī, 3, Tikamātikā, pp. 151, 152, 156, 157;
Yaṃ taṃ rūpaṃ saṃdassanaṃ taṃ atthi sappatighaṃ, atthi appatighaṃ, Atṭhasālini, 4, 16, p. 244 - 245;
Yaṃ rūpaṃ sappatighaṃ taṃ atthi indriyaṃ—Atṭhasālini 4.17, pp. 244-45.

motion, while aghātaśarīra allows the passage of another form of Matter through it. Even infinite atoms can exist in one space-point. Each ultimate atom or aggregate is individually impenetrable, but all ultimate atoms and aggregates (skandhas) are not impenetrable, for they can exist in one space-point. At one stage of it an ultimate atom is impenetrable. This is the basic difference between the impenetrability of the Buddhist elements (dharmas) of Matter and that of the Jaina ultimate atoms or the effects of Matter.

Though the Buddhist Philosophy denies the existence of any permanent substance possessing inherent qualities, it can be said in a nutshell that hardness (or repulsion), cohesion (or attraction), heat and motion¹ are respectively the four essentials or specific properties of the four fundamental elements of Matter, viz. earth, water, fire and air, which are manifested by them. Besides, the four sensibles, viz. colour, taste, smell and touch², can also be counted as the properties of Matter (Rūpa) according to the Buddhist Metaphysics, for it recognizes only guṇas (qualities) as elements of Matter by denying the substances.

The four essentials—hardness, cohesiveness, heat and motion, predominate in earth, water, fire and air respectively. For this reason they are termed as pṛthivī (earth), ap (water), tejo (fire) and vāyu (air) technically, but paṭhavī-adhika,³ apo-adhika substances and the like are not themselves paṭhavī (earth), apo (water), etc. It is explained by the commentators that “apo is that which diffuses itself throughout its coexistent

1. See Dhammasaṅgani and Aṭṭhasālini, (Rūpaskandha); Bhūtaṇi pṛthivīdhāturaptejovāyudhātavaḥ Dhṛtyādikarmasāmsiddhāḥ kharasnehoṣṇateranāḥ, Abh. K., 1.12.
2. Kāme aṣṭadravyako aṇuḥ rūparasagandhasparśā iti catvāri dravyāṇi pṛthivyaptejo vāyuḥ iti catvāri, Abh. K., 1.22, Sphuṭārthā.
3. i. e. preponderating in paṭhavī.

qualities or that which increases the bulk of them.¹” “It is that which heaps them well together, without allowing them to be scattered about or that which imbibes (absorbs) them or that which holds or collects them together as it were by imbibition.”²

Leaving aside the etymological derivation of apo from āpeti, appāyati, pāti or pivati, it is to be observed that both the Ceylonese and Burmese traditions suggest that apo is ‘cohesion’ (bandhanattanarūpassa).³

The mass is held together by the force of cohension; on its removal by splitting the mass, only cohension—the force of attraction is left in them. In the case of the reduction of the fragments to smaller particles, it exists inhering in upto the ultimate individual atoms. This fact shows the correctness of the phrase “diffuses or locates itself by pervading its co-existent qualities.” The phrase “increase the bulk of them” is justified by the thing that a great body is constituted of smaller bodies by this force of attraction (cohesion). The remaining phrases are justified by the fact that cohesion holds together a mass of matter.⁴

“Poggharaṇa-svabhāva” or fluidity is accepted as the characteristic mark (lakkhaṇa) of water, while regarding cohe-

1. Āpeti saha-jātarūpāṇi pattharati, appāyati vā rūhetti vaddhetthi āpo (Ceylon, Cyclopaedia, p. 167 on Abhidhammattha-Saṅgaha), vide Compendium of Philosophy, p. 268. No mention is made of watery element (āpo).
2. Āpeti saha-jātarūpāṇi vyāpetvā tiṭṭhati;...avippakiṇṇāṇi katvā bhuso Pāti rakkhati pivati vā pivanto viya tāni saṅganhāti saṃpiṇdetthi āpo, Ledi, Sadaw, p. 246. It is to be noted that water is not that which imbibes, but that which is imbibed Cph. pp. 267-9.
3. Dhammasaṅgani 8, 652; So Buddhaghoṣa comments on this passage, A. Sl. p. 355, vide Compendium of Philosophy, pp. 268 ff.
4. Compendium of Philosophy, pp. 268 ff.

sion as its functions (*kieca*).¹ But it should be noted that still more fluidity is possessed by air than water, hence 'poggharaṇa' does not clearly suggest water any more than it implies air. According to the Buddhists, fluidity is associated with apo (water), just as it is found in the Nyāya-Vaiśeṣika Philosophy; water is mentioned as an apo-adhika substance (i. e. preponderantly cohesive). The physical sciences maintain that there is more cohesion in solids than in liquids and gas; whereas the Buddhist system of thought regards hardness or firmness (*kak-khalatta*) as the characteristic mark of solids (*paṭhavī*), because, however, a solid may be apparently cohesive, once it is broken up, its original cohesiveness goes away, but there does not take place recohesion. But a liquid cannot be divided because it tends to re-coalesce immediately. Similarly, air behaves in the same manner to some extent, but its capacity of expansion without limit tends to counteract the force of cohesion holding the particles of air or gas together.² Therefore, air is conceived in the Buddhist Philosophy as the type of mobility (*vāyuraṇa*=motion). Tejo (fire) is heat; cold or relative absence of heat is not mentioned in the Buddhist Metaphysics as a force distinct from heat. 'Lambent' and 'fiery' may only fit occasionally in popular phraseology. Fire matures; sharpens, intensifies or imports heat to the other three essentials. Vāyu (air) is that which as the condition of motion to another place brings about the impact of one essential with another.³

In the words of Ledi again "that which vibrates or oscillates; that which, as a condition of motion in space, moves the series of elements to a different place, or carries its co-existent qualities from place to place", (p. 240), i. e. motion (*iraṇa*) is the essential of vāyu.

According to the later Vaibhāṣikas, the air-atoms are

1. Compendium of Philosophy, pp. 268 ff.
2. Ibid.
3. Vāyati deśāntaruppattihetubhāvena bhūtasamghātaḥ pāpetti vayo, C. Ph., p. 270. (Ceylon, cy., p. 167).

touch-sensibles possessing impact or pressure (īraṇa) as their characteristic property; they constitute air-element by aggregation; the fire-atoms are colour and touch-sensibles with heat as their characteristic property, and constitute fire-element by aggregation; the water-atoms are taste, colour, and touch-sensibles having a characteristic viscosity and they constitute water element by combination, and the earth-atoms are smell, taste, colour, and touch-sensibles possessing a characteristic property of dryness or roughness of hardness (kharatva) and constitutes earth-element.¹ Here the Vaiśeṣika influence is evidently felt on the later Vaibhāṣika conception of properties of Matter.

KINDS OF PROPERTIES OF RŪPA (MATTER)

Colour : According to the Vaibhāṣikas, there are stated to be four kinds of primary colour, namely, blue, red, yellow and white and there are eight kinds of secondary colours of cloud, vapour, dust, dew (mihika), shadow, heat, light and darkness respectively. Black colour does not find mention in the list of primary colours as it is found in Jaina Philosophy. And shape is of eight kinds, viz. long, short, round, spherical, high and low, even and uneven. Thus there are twenty kinds of Rūpa (colour and shape).² Spherical and round shapes are common to both Jaina and Buddhist Metaphysics, the former

1. Kāme aṣṭadravyakośabdaḥ paramāṇuranindriyaḥ,
ABh. K., II. 22;
rūpa-rasa-gandha-sparśa iti cattvāri dravyāṇi-prthivyaptejovāyu, iti catvāri, also kharasnehoṣṇeraṇā svabhāvāni bhūtāni, Abh., K. Spht.;
Bhūtāni prthividhāturaptejovāyudhātvaḥ dhṛtyādikarma-saṁsiddhāḥ, kharasnehoṣṇaterāṇāḥ, Abh. K., I. 12.
Vide the Positive Sciences of the Ancient Hindus, pp. 92-93.
2. Rūpaṁ dvidhā vimśatidhā, Abh., K., I. 10.

mentions triangular, square and rectangular shapes in addition to them and another which is none of them.

Taste : The Vaibhāṣikas maintain that taste is the aggregate of a class of atoms. So, according to them, it is a substantial entity. Those atoms called taste are endowed with the nature distinct from colour, shape, and sound-atoms. Like other atoms, i. e. colour-atoms, etc., taste-atom also is modifiable (savikāra) and impenetrable (sapratigha). Thus, because of being modifiable and impenetrable, taste-atom also will be included in Rūpa (Matter). For this reason they have been included in rūpaprasāda. Like the Vaiśeṣika the Vaibhāṣika school divides taste into six kinds, viz. madhura (sweet), amla (acidic), lavaṇa (saltish), kaṭu (sour), kaṣāya (astringent) and tikta (bitter), though it is mainly divided into infinite kinds from the secondary points of view. Various kinds of tastes are produced by different kinds of mixtures of taste-atoms. It is to be noted that here six kinds of taste are mentioned, whereas in Jaina Metaphysics only five kinds of taste are enumerated. The basic difference between the two views in regard to the number of tastes is this that the Buddhist Philosophy has accepted the saltish taste as an additional one on the basis of the Vaiśeṣika doctrine of Matter.

Smell : In the Vaibhāṣika view smell is the aggregate of a class of atoms. These atoms also are distinct from other atoms. According to this concept, bhautikatva (materiality) is the general characteristic of smell. In the smell-entity which has not been the object of smelling perception (or sensation) of any being, the objectivity of perception produced by the sense of smell cannot be called the general characteristic of smell, because it will be avyāpta (non-related or non-pervasive). Smell is mainly divided into two kinds, viz. pleasant and unpleasant as they are found in the Jaina and Nyāya-Vaiśeṣika systems of thought. On the basis of intensity and non-intensity in each of them they are sub-divided into four kinds—two kinds of pleasant smell and two kinds of unpleasant smell.

TANGIBLE OR TACTILE ELEMENT (SPRAṢṬAVYA)

The aggregate of a class of combined atoms has been called *spraṣṭavya* (tactile or tangible); it is a substantial entity; it is not qualitative entity like that of the *Vaiśeṣikas*. The objectivity of perception produced by the tactile sense-organ (skin) cannot be called the general characteristic of it, for, really speaking, that characteristic will become *avyāpta* (non-related or non-pervasive) in the tactile element which did not come into perception of any being. According to the previous procedure, all these—*rūpa* (colour and shape), *rasa* (taste) and *gandha* (smell) being different, materiality (*bhautikatva*) also cannot be accepted as the general characteristic of *spraṣṭavya* (tangible), for it will be *avyāpta* in the tangibility like roughness or hardness, etc.

This *spraṣṭavya* is divided into eleven kinds, viz. *pārthiva-sparśa* (earthy touch), *jalya-sparśa* (aquatic touch), *taijasa-sparśa* (fiery touch), *vāyavya-sparśa* (airy touch), *mṛduta* (softness), *karkaṣatā* (hardness or roughness), *gurutva* (heaviness), and *laghutva* (lightness), *śītatva* (coldness), *vubhuṅṣā* (hungeriness or appetite) and *pipāsā* (thirst). Soft, hard, heavy and light and cold touches are common to both the Jaina and Buddhist traditions. As a result of particular closeness (*sanniveśa*) of the elements like earth, etc., there takes place the contact of the physical senses with particular condition, so one thinks of the necessity of heat; that of particular condition is *śītatva* (coldness). *Vubhuṅṣā* means the desire to eat, this is a kind of mental element. It can never be included in the *spraṣṭavya dharma* (tangibility), belonging to *Rūpaskandha* (material aggregate). Hence, in this case of *vubhuṅṣā* it will be understood that there takes place in the animal body a kind of temporary transformation of earth-element in the inner part of the stomach. If there is the contact of the physical sense with that, there arises the desire of beings for eating. As that material transformation

inside the stomach is the cause of vubhukṣā, it has been called vubhukṣā. In the cause there is the analogical application of the effect-indicating word. In the scripture the birth of Lord Buddha has been called happiness. It is the mental element and birth is the physical element, so birth and happiness cannot be one and the same. In spite of such division the birth of Lord Buddha has been called happiness. He is born for various kinds of emergence and attainment of liberation. So his birth, because of being helpful to happiness like abhyudaya (emergence) and niḥśreyasa (liberation) has been called happiness analogically. This is the analogical application of the effect-indicating word in the cause. Similarly, pipāsā also, belonging to the spraṣṭavyadharmā should be understood as a kind of transformation, not as the desire for drinking. Such kind of mental element cannot be included in spraṣṭavyadharmā (tangible-element). The internal physical transformation with which the contact of the physical sense leads the beings to desire for drinking has been called pipāsā in this case.¹

In regard to the general properties of Matter, viz. colour, taste, smell and touch the basic difference between the Jaina view and those of other Indian systems of thought is this that according to the former, they are inherent in all forms of Matter whether molecules or ultimate atoms, whereas they are regarded as the specific qualities of the four elements of Matter in the latter. According to their views, only earth possesses four characteristics, viz. colour, taste, smell and touch. In the physical sciences the Jaina view regarding the four general characteristics of Matter, viz. colour, taste, smell and touch, is well supported to a considerable extent. Besides, their respective divisions also compare well with those of the same four kinds of property of Matter as demonstrated in the physical sciences.

1. Vaibhāṣikadharśana of Anantakumāra Bhaṭṭācārya, (Bengali) Rūpaskandha, p. 88.

In addition to the four general characteristics of Matter (Pudgala) certain common properties are associated with all the three states of it, viz. solid, liquid and gaseous. Matter possesses the property of cohesion and adhesion (snehakāyatva or saṁghātaguṇa),¹ impenetrability,² extension,³ divisibility (bhedatva or pradeśatva),⁴ porosity and compressibility⁵ (or condensation and taking up subtle form) and density⁶ and elasticity, etc.⁷

Cohesion is the force of attraction between molecules (or aggregates) of the same type and adhesion is the force of attraction that exists between molecules of different nature. Cohesive force holds molecules together in a material substance and adhesion is the cause of sticking together of the two material substances (pudgaladravyas), e. g. gluing of wood to wood. The combination of ultimate atoms takes place owing to the presence of the property of oily body or sticky substance (sīṇhakāe), i. e. cohesiveness and adhesiveness inherent in them. Thus two ultimate atoms may combine together into a skandha (molecule) because of their property of cohesiveness and adhesiveness.

1. Sīṇhakāe poggale, BhS., 1. 10. 80; Gahaṇaguṇalakhane, Ibid., 2. 10. 118.
2. Abhejja, Ibid., 20. 5. 670.
3. Poggalatthikāe, Ibid., 2. 10. 118;
Ajīvakāyā dharmādharmākāśapudgalāḥ, TS., ch. V. 1.
4. BhS., 16. 6. 582; Ekapradeśādiṣu bhājyaḥ pudgalānām, TS., V. 14; Bhedāt, TS., V. 27.
5. BhS., 6. 7. 247; 1. 6. 54.
6. Paṇṇavaṇā, Alpatvabahutva.
7. Doṇham paramāṇupoggala egayo sahanamti doṇham paramāṇu poggalāṇam atthi sīṇhakāe, BhS., 1. 10. 80.

IMPENETRABILITY¹

It is a property of Matter by virtue of which two bodies cannot occupy the same space at the same time. In regard to this property there arises the contradiction in the Jaina conception of impassability or impenetrability of ultimate atom (*paramāṇu*), for there can exist one to infinite ultimate atoms or molecules in one space-point in a subtle form.

Extension : It is the property of Matter by virtue of which every body occupies some definite space. As an *astikāyadravya* (extensive substance) Matter has existence as well as extensive magnitude; even an ultimate atom has the property of extension of one space-point.²

Divisibility (*Bhedatva*) : It is the property of Matter by virtue of which a material substance can be sub-divided into extreme minute parts. Even greater sub-division of the particles of Matter takes place when a scent or perfume spreads out in air. A *ketaki* flower smells out for hours without any visible changes in mass. Its smell spreads through the air. Neither the *ketaki* flower nor the core of it blows with the air, but the finest division (atom of smell) of matter blows with the air.³ That is why there is found the smell pervading the atmosphere and the air surcharged with it.

Porosity⁴ : It is the property of Matter by virtue of which one material substance enters or diffuses into another easily and rapidly; all bodies contain pores more or less; these pores point to spaces intervened between one cluster of molecules and another, e. g. solid, ash or sand, liquid water, gas etc.

1. *Paramāṇupoggale naṃ Bhaṃte asidhāraṃ vā khuradhāraṃ vā ogāhejjā...no tiṇaṭṭhe samaṭṭhe, no khalu tattha satthaṃ kamaṃ*, BhS., 5. 7. 213; 20.5. 670.
2. BhS., 1.3.4.481 ; TS., ch. V.1.
3. *No koṭṭhae vāti javāu. no keyai vāti ghāṇasaḥagatā poggalā vāti*, BhS., 16.6.59.
4. BhS., 1.6.55 ; RV., p. 465.

Compressibility¹ : It is the property of Matter by virtue of which it can be compressed so as to occupy a smaller volume by the application of external pressure because of there being pores contained by all bodies, e. g. cotton, hair and air.

Density² and Elasticity : Density is the mass per unit volume of body, so it is a universal property of all forms of Matter—molecules or ultimate atoms, for all material bodies must have some mass. Elasticity which is possessed by all matters more or less in all the three states of them—solid, liquid and gas is the property of offering resistances³ to change in size or shape.

SECOND SECTION

MOTION (GATI) OF MATTER (PUDGALA)

OSCILLATION OR VIBRATION

According to Jaina Philosophy, there are stated to be two kinds of bhāva (state) of substance, viz. parisvandātma and aparisvandātma (vibrating and non-vibrating or mobile and immobile).⁴ Dharma (Principle of Motion), Adharma (Principle of Rest) and Ākāśa (Space) is immobile. There is no capacity in them for making movement at all.⁵ Soul (Jīva) is immobile by nature but the capacity for movement is intrinsic in it and an element (pradeśa) of Soul moves by the contact of karmic matter due to the activities of the material mind, speech and body.⁶ Matter (Pudgala) possesses the nature of both

1. BhS., 6. 7. 247 (hair) ; 1.6.54 (air).

2. BhS., 1. 6. 53 (alpa bahutva); see Paṇṇavanā (alpa bahutva).

3. BhS., 1. 6. 54 ; Sthā., 211. 6.

4. Dravyasya hi bhāvo dvividhaḥ-parisvandātmakaḥ aparisvandātmakaśca, TRV., V. 22.21.

5. Niskriyāni ca tānti parisvanda-vimuktitaḥ, T Śl. V. 7. 2.

6. Yogātmapradeśa-parisvandaḥ, TRV., II. 25. 4.

mobility and immobility or vibration and non-vibration. In the *Tattvārtha Rājavārtika* *parispandana* (vibratory motion) and *aparispandana* (non-vibratory motion) have been called *kriyā* (activity) and *pariṇāma* (change or transformation)¹ respectively, while in the *Pradīpikāvṛtti* of *Pravacanasāra* *parispandana* has been called *kriyā* (activity of action) and each *pariṇāma* (change = *arthaparyāya-pariṇāma*) has been stated to be *bhāva* (state or condition).² *Siddhasena Gaṇin* has called 'parispandetara' *prayogajaparyāya-svabhāva-pariṇāma*³ ('non-moving' voluntary modal nature as change).

PARISPANDANA (RESOLUTION OF ALL PHYSICAL ACTION INTO MOTION)

Dr. B. N. Seal explains that "Parispandana sometimes stands for motion-molar as well as molecular, but more often for the subtle motion of atoms or molecules."⁴ The term "parispandana" signifies "whirling or rotatory motion, a circling motion," but also simple harmonic motion, e. g. vibration. "All action, operation, work (*kriyā*, *vyāpāra*) is ultimately traced to this form of subtle motion lodged in the atoms or in the matter-stuff."⁵ As for example, a cosmic vibratory motion is stated by the *Vedānta*.⁶ *Ākāśa* is "the first stadium in the evolution of Matter, which gives off *Vāyu*, which gives of *tejas*

1. *Parispandātmakaḥ kriyātyākhyāyate itaraḥ pariṇāmaḥ*, TRV., V. 22.21.
2. *Pariṇāmamātralakṣaṇo bhāvaḥ, parispandanalakṣaṇa kriyā*, *Pravacanasāra*, *Pradīpikāvṛtti*, II. 37, p. 182.
3. *Dravyasya svajātyaparityāgena parispandetaraprayogajaparyāyasvabhāvaḥ pariṇāmaḥ*, TS., Bhā. Tī, V. 22, p. 350.
4. *The Positive Sciences of the Ancient Hindus*, p. 121; molar (A)=having power to grind. (N) Back teeth.
5. *The Positive Sciences of the Ancient Hindus*, p. 121.
6. *Sarvalokaparispanandanam*, Śaṅkara, Vide *The Positive Sciences of the Ancient Hindus*, p. 121.

and so on; but Ākāśa (ether) itself passes through two stages before the emanation of the sūkṣmabhūta vāyu : (1) the motionless ubiquitous primordial matter-stuff (answering to the Sāṃkhya Bhūtādi) called Purāṇam Khaṁ, and (2) a subtle integration, the pure unquintuplicated sūkṣmabhūta called Vāyuram Khaṁ, answering to the Sāṃkhya Tanmātra stage. It is this subtle Ākāśa, in its Tanmātric integration, i. e. in the derivative form, which is subject to an incessant Parispanda. The gaseous stage of matter (The Vedāntic Vāyu) is indeed matter in a stage of Parispandic motion.¹ So also the biomotor and sensori motor principles apart from the directive intelligence of the self.²

This parispanda is conceived also by the Sāṃkhya philosophy to describe every process and phenomenon of cosmic evolution.³ "Bhūtas, organisms, mental organs, as modes of Prakṛti (considered apart from the Intelligence of Puruṣa) are also subject to this Parispanda."⁴ But Prakṛti (the Primordial Matter) as the unmanifest ground can have no Parispandic motion⁵ (or mobility), though the action of evolution belongs to it. Here the question is how did the similarity of thought (vicārasāmya) come into both the Sāṃkhya and Jaina philosophies from evolution or transformation in regard to Parispandana. In the Sāṃkhya it is stated.

1. Vāyoḥ parispaṇḍātmakatvāt—Śaṅkara.
2. Prāṇasya parispaṇḍātmakatvādevayadadvaitam sthūlam sūkṣmam ca tatsarvaṁ manaḥ sanditamātram—Śaṅkara, Vide P. S. A. H., p. 122.
3. Vyaktam sakriyam parispaṇḍavat, Tattvakaumudī, 10, Vācaspati Miśra.
4. Tathā hi buddhyādayo upāttamupāttam deham tyajanti dehāntaram ca upādadata, iti teṣāṁ parispaṇḍaḥ śarīra-prthivyādīnām ca parispaṇḍaḥ prasiddha eva, Ibid., Vācaspati on Kārikā, 10.
5. Yadyapi avyaktasyāpi pariṇāmalakṣaṇa kriyā, tathāpi parispaṇḍo nāsti. Ibid., on Kārikā, 10.

that there takes place evolution in all things except in the Sentient Principle (Cetanaśakti=Puruṣa), while Jaina Metaphysics maintains that both Matter and Soul undergo transformation. In the Sāṃkhya, there is stated to be the unmanifest and manifest conditions (avyakta and vyakta avasthā) of Prakṛti (Primordial Matter), while in Jaina Philosophy Jīva (Soul), Dharma (Principle or Motion), Adharma (Principle of Rest), and Ākāśa (Space) are unmanifest (avyakta). According to this philosophy, there is a state of aparispandana (non-vibration or non-mobility) of Soul (Jīva). The worldly soul and Matter possess spandana (vibration or rotatory motion). Dharma and Adharma are the efficient causes in the motion and rest respectively of the worldly souls and Matter.

The Jaina conception of utpāda (origination), vyaya (decay) and dhrauvya (permanence)¹ of the reals corresponds to the Sāṃkhya view of pariṇāma (transformation) of Prakṛti or of all things. According to Jaina philosophy, there continues pariṇāma (transformation) in the liberated souls, the worldly souls and all forms of Matter. Parispandana (vibratory motion) takes place in Matter. In the unmanifest stage of Prakṛti there is a state of equilibrium (sāmyāvasthā). The sadṛśapariṇāma (evolution of like to like) of the Sāṃkhya corresponds to the arthaparyāya of Jaina metaphysics which takes place in all substances—Soul, Matter, etc. The Sāṃkhya maintains that when the disturbance occurs in the state of equilibrium of Prakṛti, it becomes manifest, i. e. parispandana. In the Jaina tradition the principle of utpāda (origination)—vyaya (decay) dhrauvya (permanence) is parispandana (vibratory motion). Soul is aparispandanātmaka (non-vibratory), but not so is kriyā (activity) of Matter. In regard to these parispandana and aparispandana of Matter it appears that the Jaina and Sāṃkhya views are one at the root of speculation about this problem.

According to the Nyāya-Vaiśeṣika, parispandana is found in

1. Utpādavyayadhrauvyayuktaṃ sat, TS., V. 29.

all forms of Matter except in Ākāśa (space) which is conceived as non-atomic and inactive. All the four classes of atoms, viz. air atoms, fire-atoms, water-atoms and earth-atoms are in continual motion. The universe at bottom is an infinitude of unceasingly vibratory particles.¹ "All physical action consists in motion."² Force, power and operation (śakti) are recognized by this philosophy as only the modes of motion. It is said by Jayanta Bhaṭṭa that no mysterious power or operation which is not and cannot be apprehended by the senses is acknowledged. "But this denial of force (śakti) and of unperceived and unperceivable operation (atīndriyavyāpāra) is advanced as the philosophical proposition to show the correctness of the Nyāya treatment of the causal nexus to mere invariable and unconditional antecedence among phenomena without productive power of efficiency."³ Parispanda is of the nature of motion and is the ultimate form of activity in spite of its being subtle and hence infra-sensible (sūkṣma and anudbhutarūpa, not atīndriya).⁴ It is explained that an effect is the total outcome of the combined motions of the various (material and efficient) causes involved in all cases of material causation, e. g. in the case of chemical action (pāka).⁵ Sa

1. Anavarataparispandamānaparimitapavanādīparamāṇavaḥ, Raghunāth;
compare also paramāṇavaḥ in gatiśīlatvāt patatravya-
padeśaḥ patantīti, Nyāyakusumāñjali, Stavaka. V.
Vide The Positive Sciences of the Ancient Hindus, p. 122.
2. The Positive Science of the Ancient Hindus, p. 123.
3. Anyathāsiddhiśūnyasya niyatapūrvavarttitā, Bhāsāpari-
cheda, Vide The Positive Sciences of the Ancient Hindus,
p. 123.
4. Parispandana eva bhautiko vyāpāraḥ karotyarthaḥ atīn-
driyastu vyāpāraḥ nāstīti brūmaha tasmāt kārakacakreṇa
calatā janyate phalaṁ na punaścalanādanyo vyāpāra upa-
labhyate, NM., Ābnika, 1, p. 18.
5. e. g. in the case of pāka, samudīta devadattādisakalakāra-
kanikaraparispanda eva viśiṣṭaphalāvaccinnaḥ pāka ityu-

all action of matter on matter is converted into in this way, just as it is found in Jaina philosophy.

The basic difference between the Nyāya-Vaiśeṣika and the Sāṃkhya-Vedānta on Parispandana (vibratory motion) is this that the former maintains that the conscious activity is sharply distinguished from all forms of motion, according to the former, while the latter considers everything except Intelligence, Puruṣa (the transcendental Self) to emerge in "the course of cosmic evolution, and hence to be subject to pariapandic motion."¹

It is to be noted that the Mīmāṃsakas accept śakti (power), while the Naiyāyikas reject it. But the Jains accept power in an entity. In Jaina philosophy Matter and Soul are stated to be active, while the Principles of Motion and Rest and Space are called inactive.² That is, the Principles of Motion and Rest and Space cannot make movement like 'reaching' another place from one place as a result of motion. The denial of the universal activities like origination, decay, etc., is not meant here in the aphorism "Niṣkriyāṇi ca".³ Origination and decay of arthaparyāya (unceasing modification) take place in them. Soul also is inactive by nature because it is aparispandana (non-vibratory). Due to no-karma (quasi-karma) parispandana (vibratory motion) occurs in the elements of Soul

cyate ... atha vyāpāra evaiṣaḥ sarvvaḥ sambhūya sādhyate
kiṃ phalenāparāddham vaḥ taddhi samblhūya sādhyatām
NM., A. 1, p. 18.

1. Kriyāviśeṣa evāyaṃ vyāpāro jñāturāntaraḥ spandātmaka-
bahirbhūtakriyālakṣaṇavilakṣaṇaḥ, Quoted in NM., A. 4.
Vide, P. S. A. H., p. 123.
2. Niṣkriyāṇi ca, TS., V. 6, p. 326.
3. Pudgalajīvavartivī yā viśeṣakriyā deśāntaraprāptilakṣaṇa
tasyāḥ pratiśedho ayaṃ, notpādādisāmānyakriyāyāḥ, TS.,
p. 327.

Pudgalāstvito deśāntaramāskandantaḥ samupalabhyante
jīvaścetyataste kriyāvantaḥ, Ibid.

by the relation of karmic body with it, for this reason it has been called active (*kriyāvanta*).¹

On the disjunction (or dissociation) of the karmic body as a result of the destruction of eight kinds of Karma, Soul becomes non-vibratory (*aparispandanātmaka*). There takes place the upward motion of Soul when it is released from the karmic body.² It reaches the *Siddhasthāna* by that motion.³ The *parispandanātmaka kriyā* (vibratory activity) like contraction and expansion of *pradeśas* (elements) of Soul, which occurs in it, is produced by the previous action. In the worldly souls there is happening at every moment *arthaparyāya* like origination and decay of infinite knowledge, self-awareness, energy and unthinkable experience of happiness. Soul cannot attain liberation as long as it is active because the relation of Soul with Matter continues as long as its acts.⁴

Kriyā (activity) is stated to be endowed with the characteristic of *parispandana* (vibratory motion or oscillation).⁵ Motion is the nature of Matter; activity takes place in it due to the nature of *parispandana* (vibratory motion); it is capable of activity by its capacity of *parispandana* (vibratory motion).⁶ Therefore, it is endowed with activity. It is active by its own capacity.⁷ Internally activity is associated with the changing

1. *Kārmaṇa-śarīrālambanātmapradeśaparispandarūpa kriyā*, T Śl., 2. 25, p. 331.
2. *Tadanantaramūrdhvaṃ gacchatyā lokāntāt*, TS., 10.5, p. 298.
3. *Pūrvaprayogād asaṅgatvād, bandhacchedāt, tathāgatipariṇāmācca tadgatiḥ*, TS., 10.6.
4. *Jāva caramaṃ Bhaṃte ayaṃ jīve eyati veyati calati phamdati tāyaṃ caramaṃ nānāvaranijjenaṃ jāva antarāṇa bajjhaviṃti ? haṃtā Goyama ! BhS., 3.3.153.*
5. *Parispandanalakṣaṇā kriyā*, PPV, p. 182.
6. *Ibid.*
7. *Sāmarthyātsakriyau jīvapudgalāvitī niścayaḥ jīvasya niṣkriyatve hi kriyāhetutā tanau*; T Śl 5.7.2, p. 398.

capacity (capacity of change). Matter is not by any means non-motive, static and inactive. It is not true that Matter is active in all fields (kṣetras), at all times (kālas) and in all conditions (bhāvas). Sometimes it is active and sometimes it is inactive.¹ Having remained immersed in one space-point, it vibrates or oscillates or makes revolving motion.² Activities made by vibration are not continuous; it is accidental.

There can be infinite divisions of activity with regard to infinite modes. Generally, there are stated to be many divisions of activity (kriyā)³, but from the particular point of view there can be the following divisions of it with regard to nimitta (cause), applied (prāyogika) and natural (vaisrasika) processes and its own form (nature), i. e. motion in one place and motion to another place, and integration and disintegration (bandha-bheda). In the Jaina Āgama Bhagavati Vyākhyāprajñapti the word 'vai' (to vibrate or to oscillate) has been used to stand for motion in one place (space-point). There are stated to be two kinds of kriyā (activity or movement), viz. samita (limited) and vividha (various).⁴ A few kinds of motion for reaching another place are described below :

(1) Anuśreṇi and viśreṇi (motion in a line and motion out of lines), avigraha (non-curvilinear-motion or motion in non-curved line) and vigraha (curvilinear motion or motion in curved line) and ṛjudgati (motion in straight line) and kuṭila gati (complex or crooked motion).

(2) Pratighātin gati (impeded or resisting motion) and apratighātin gati (unimpeded motion).

1. Paramāṇupoggale siya eyati, veyati, jāva pariṇamati, siya no eyati jāva no pariṇamati, BhS., 5.7.213.
2. Egapaesogāḍhe poggale see tammi vā ṭhāṇe, annammi vā ṭhāṇe jahañṇenaṃ egam samayaṃ, ukkoseṇaṃ āvaliyāe asaṃhkejjabhaṅgaṃ ciraṃ, BhS., 5. 7. 215.
3. Pudgalānāmapi dvidividhā kriyā visrasā-prayoganimitṭā ca, TRV., 5.7.17.
4. BhS., 3.3.153 (comm).

(3) *Spṛṣṭa gati* (touching motion) and *asṛṣṭa gati* (non-touching motion).

(4) *Ūrddhagati* (upward motion), *adhaḥ gati* (downward motion) and *tiryag-gati* (horizontal motion).¹

Some kinds of *kriyā* (movement or activity) of the worldly souls or beings have been described in the following manner :

(1) *samīṃ eai* (*samita kampana*=limited vibration), (2) *veai* (*vividha kampana*=various vibrations or oscillations), (3) *calai* (*calana-gamana*=going), (4) *phandaei* (*spandana*=pulsation or oscillation), (5) *ghaṭṭai* (*saṃghāta*=striking or colliding or friction or sudden pushing), (6) *khuvvai* (*prabala-tā-pūrvakapraveśa*=forcible entry), (7) *udīrai* (*pravalatāpūrvaka-preraṇa*=*padārthāntara-pratipādana*=the act of throwing).²

Some of the rules of *gatikriyā* (motion-activity) are given below :

(1) *Anuśreṇigati* (linear motion or motion in a straight line), (2) (a) *ekasamayavigrahagati* (curved motion for an instant) and (b) *lokānta prāpiṇigati* (motion upto the last border of the Universe), (3) *paramāṇeraniyatā* (movement of ultimate atom), (4), (a) *cāla-jaghanya* (minimum movement of an ultimate atom from one space-point to another in one *samaya*=instant), (b) *utkrṣṭagati* (maximum movement from one last border to another in one *samaya*=instant), (5) *kampanakriyā-kāla* (duration or time of vibration or oscillation)—(a) minimum for one *samaya*, (b) maximum for innumerableth part of *āvalikā*, and (6) *niṣkriyakāla* (time or durations of non-vibration or non-oscillation)—(a) minimum for one *samaya*, (b) maximum for countless *samayas*.

According to the rule, the *deśāntaraprāpiṇigati* (motion from one place to another) takes place in a straight line. But on account of *prayogapariṇāma* (the applied process of trans-

1.. TS Bhā., 2.27-29, pp. 180-82.

2. Bhs. 3. 3. 153.

formation) it takes place out of the straight line.¹

MOTION IN THE NYĀYA-VAIŚEŚIKA PHILOSOPHY

In the Nyāya-Vaiśeṣika "motion is characterized as the unconditional cause of conjunction and disjunction."² The four material substances, viz. earth, water, fire and air, are capable of motion because of having limited magnitude. According to this philosophy, motion is instantaneous (kṣaṇika) and unproductive of another motion (svajātyānārambhaka.³) The Vaiśeṣika maintains that every material object moving in a particular direction must by necessary implication possess the quality of impulse (vega),⁴ which makes the continuity of its motion in the same direction possible. The quality of impulse is produced in a moving body by its first unit of motion, and so long as the impulse of the body is not neutralized by some other force, it will continue to move in the direction of its original motion.⁵ Impulse is a type of quality of saṁskāra. It is produced from one motion and leads to an other, just as the mental impression is the product of a previous experience and the cause of a subsequent one, viz. recollection.⁶ In regard

1. Anuśreṇigatiḥ, TS., 2.27, p. 180;

Sarvā gatiṃ jtvānām pudgalānām cākāśapradeśānuśreṇirbhavati, viśreṇirabhavati iti gatiniyama iti, Ibid. Bhā. p. 181;

Avigrahā jīvasya, TS., 2. 28; Vigrahavati ca saṁsātiṇaḥ prāk caturbhyaḥ, TS., 2. 29, p. 182.

2. Ekadravyamaguṇam saṁyogavibhāgeṣvanapekṣakāraṇamiti karmalakṣaṇam, VS., 1. 1. 17.

3. PPBhā., p. 290, Guṇapadārthānirupāṇam,

4. Ibid.

5. Ibid., p. 266.

6. Saṁskārastrividhaḥ vego bhāvanā sthitisthāpakaśca tatra vego mūrtimatsu pañcaṣu dravyeṣu nimittaviśeṣūpekṣāt karmaṇo jāyate niyatadikkriyā prabhandhahetuḥ sparśavad-dravyasaṁyoga-viśeṣa-virodhi-kvacit. kāraṇaguṇapūrvakramotpadyate, PPBhā., p. 646;

to motion one point is common to both Jaina and Nyāya-Vaiśeṣika systems of thought that the material substances having limited magnitude are capable of motion.

OSCILLATION IN THE PHYSICAL SCIENCES

In the physical sciences oscillations of elastic bodies, e. g. the moving piston, the crankshaft, the tree swaying in the wind, the heart beat, the motion of planets, and many others, represent *parispandana* of Jaina Metaphysics, while motion of modern physics corresponds to *gati* of the latter. According to the physical sciences, motion is the change of position of a body with them. Absolute rest is unknown, for there is no stationary point in the Universe. Everything is in motion, though one object may be at rest in relation to another. Hence there cannot be absolute rest. Rest is here relative rest; an object is at relative rest with respect to another when it does not change its position in relation to the latter. As for example, kites flying in the sky in a formation are at a relative rest in relation to each other in their continuous motion. All motion is relative and the motion of a body involves a change of its position with respect to some known object, as there is no such fixed point in nature. There are stated to be many kinds of motion in the physical sciences. The uniform circular and pendulum motions among them are a class by themselves, while all others terminate, or take a body farther and farther away from its starting point.¹ In the cases of circular and pendulum motions the path of a particle is continually retraced after a definite period of time, they are called periodic motion.² The simplest of all periodic motions are those performed by elastic bodies. The instantaneous displacements of the parts of an elastic body, when plotted against the time yield sine or cosine curves, are called harmonic curves. In general,

1. It is the *deśāntaragati* of Jaina Metaphysics.

2. It can be compared with *ekasamayavigrahagatī*, etc.

harmonic motion, may be a composite one in which several periods are present simultaneously. In the presence of a single period the motion is called simple, harmonic motion. Besides, there are stated to be two kinds of motion, viz. translatory and rotatory or both simultaneously. Translatory motion is subdivided into rectilinear and curvilinear motions. Translatory motion takes place in a body when it moves in such a manner that there occurs also such identical motion in its constituent parts that "the line joining any two points of the body always moves parallel to itself when body is in motion. That is, the distance traversed by one point is equal and parallel to the distance traversed by the other point according to the rule that all the points in the body have identical straight line motion, e. g. vertical motion of rain drop or stones from a height, the running of the train on straight rails, the motion of a bullet from a gun." This translatory motion of the physical sciences compares well with the *anuśreṇī gati* of Jaina Metaphysics.

The motion of translation taking place along curved line in the way that any line in the body remains parallel to itself is known to be a curvilinear motion, e. g. the motion of an automobile or of a train rounding a curve. This curvilinear motion corresponds to the *viśreṇigati* of Jaina Philosophy. Rotatory motion takes place when a body turns about a fixed point of axis, e. g. the whirling motion of a stone tied at the end of a string held in the hand. The motion which involves both rotation and translation of an object is called a complex motion resulting from the combination of rotation and translation, e. g. the rolling down of a banking aeroplane in its curved flight in the sky. The *vigrahagati* and *kuṭīlagati* of Jaina Metaphysics may be compared to the rotatory and complex motions of the physical sciences respectively.

It can be said from the above analysis of motion that in both Jaina Philosophy and modern physics the motion of a body is specified by its successive positions in time. Both of them study motions taking place along a straight line as well

as a curved line, a uniform horizontal motion and a vertical motion of free fall. Jaina Metaphysics goes deep into the problem of motion of matter in all its subtlest forms over and above the translatory, curvilinear, rotatory and complex motions of the physical sciences, as it is suggested by a brief outline of this subject.

SIXTH CHAPTER

EFFECTS AND MODIFICATIONS OF MATTER

FIRST SECTION

EFFECTS OF MATTER

As pointed out previously, according to Jaina metaphysics, Matter exists in Nature, occupying some volume in perceptible and imperceptible conditions within the sensuous and supersensuous experiences in various forms of modifications. Its effects appear as six *kāyas*, viz. *pr̥thivikāya* (earth-embodiment), *ap̥kāya* (water-embodiment), *tejakāya* (fire-embodiment), *vāyukāya* (air-embodiment), *vanaspatikāya* (plant-embodiment or vegetation) and *trasakāya* (embodiment of mobile beings),¹ and *śarīra* (gross organic body), *vāk* (speech or voice), *manas* (mind) and *prāṇāpāna* (respiration), while its manifestations are found to exist in the forms of *śabda* (sound), *bandha* (union or combination), *saukṣmya* (fineness), *sthaulya* (grossness), *saṁsthāna* (shape), *bheda* (division), *tamas* (darkness), *chāyā* (shadow), *ātapa* (heat, sunray) and *udyota* (cool light, moonlight).² It is to be noted that *tamas* (darkness), *chāyā* (shadow), *ātapa* (sunshine or heat) and *āloka* instead of *udyota* (moonlight, cool light), have also been accepted as *bhautika* (material) or *rūpa* (matter) in the *Vaiśiṣṭika* school of the Buddhists on the ground that they are apprehensible to the sense of sight with colour and shape (*varṇa* and *saṁsthāna*).

1. BhS., 24. 12. 21. 702-707 ff; 25.4. 739; GS., *Jivākāṇḍa*, 182; *Śarīravāṇmanahprāṇāpānāḥ pudgalānām*, TS., V. 19, p. 341.

2. *Śabda-bandha-saukṣmya-sthaulya-saṁsthāna-bheda-tamaschāyātapyotavantaśca*, Ibid., V. 24., p. 356.

Kāya (Embodiment) : It is caused by the operation of Karmas which make the bodies of the mobile and immobile beings. They are inseparably connected with the genus (jāti)—(body-making karma).² As mentioned above, it is of six kinds, viz. earth-embodiment upto the embodiment of mobile beings.³ In the physical sciences also they are regarded as the effects of Matter. Bodies (or embodiments) of earth, water, fire, and air-bodied souls exist (i. e. are formed) by the operation of the earth, water, fire, and air-body-making karmas as a rule with their respective suitable qualities like colour, taste, smell, touch, etc. and materials.⁴

Having taken into consideration the four kinds of each of the above four embodiments (effects) of Matter, the following divisions are mentioned, viz. (1) earth in general (sāmānya-pṛthivī), (2) earth-soul (pṛthivī-jīva), the soul which is in transmigratory passage, vigrahagati, immediately before being born as earth-bodied, (3) earth-bodied soul, the soul which has taken up an earth-body (pṛthivī-kāyika), and (4) earth-body (pṛthivī-kāya). Water, fire and air also are of four kinds, just as earth is described. That is to say, the effects—earth water, fire and air, etc., having the qualities of colour, taste, smell and touch, undergo transformation into bodies (kāya) by the operation of the nāma-karmas, such as, pṛthivī-nāma-karma, etc.

Here karma is energy, which is the attenuated form of matter. According to the physical sciences, “energy, like

1. Vaibhāṣikadarśana, pp. 67-8;

Ātapaḥ uṣṇaprakāśaḥ sūryasya, ālokaḥ śītaprakāśaḥ indoḥ
Abh., K. 1. 10, Rāhulavyākhyā.

2. Jai aviṇābhāvītasathāvara-udayaḥ have kāyo.

3. So jīvaṁmadamhi bhaṇio puḍhavi-kāyādi chabbheyo, GS.,
Jivakāṇḍa, 181.

4. Puḍhavi āteūvāyukammodayeṇa tattheva
Niyavannacaukka judo tāṇaṁ deho have niyamā, GS.,
Jiva., 182.

matter, is something which exists in Nature, though in different kinds. It pervades throughout this universe, but it has no bulk to be perceived by our senses. It has also no weight and knows no extension or compression."¹ It is to be noted that "work, whatever be its nature, can never be produced without expenditure of energy. Energy is, therefore, defined as the cause of work. So, energy and work are synonymous, i. e. what is energy is work and what is work is energy." For this reason "energy is qualitatively measured by work. As work may be of various types, the corresponding energies are differently named, depending on the type of work. The main divisions of energy are mechanical energy (energy possessed by matter on account of position, configuration or motion), heat-energy, sound-energy, light-energy, magnetic-energy, and electric body,"² i. e. they are the modifications of matter. "Each one of them is transformable into any other form or forms and this shows the ultimate identity between different kinds of energy."³

The bodies of the *prthivi-kāyika-jīva*, etc., are gross or fine due to the operation of gross and fine-body-making karma respectively. As indicated before, a body which resists another body or is resisted by another one is called gross impenetrable body (*ghātaśarīra*), while that which does not resist another body nor itself is resisted by another one is called fine body, e. g. X-Ray or *Kārmaṇa-śarīra*. Their bodies are equal to the extent of innumerableth part of a cubic finger. Gross bodies require support, but fine bodies need no support and exist everywhere in the Universe with nothing intervening between them.⁴

1. Int. Physics, S. C. Ray Chowdhury & D. B. Sinha, Calcutta, 1952, p. 2
2. Ibid., pp. 2-3.
3. Ibid., p. 3.
4. *Bādarasuhumudayaṇa ya bādarasuhumā havamti taddehā Ghādaśarīra thūlaṃ aghādadehaṃ have suhumaṃ; GS., Jīva., 183.*

VANASPATIKĀYA (VEGETATION OR PLANT-BODY)

Souls become plant-bodied by the operation of the plant-body-making *nāmakarma* (energy). They are classified into two groups, viz. *pratyeka* (one body-one soul) and *sāmānya* or *sādhāraṇa* (general or common, i. e. one body, many souls). It is called *pratyeka* when the owner of one body is one soul. The body in which many souls exist is called *sādhāraṇa* (common body). Individual (body) is sub-divided into *pratiṣṭhita* (host with common parasites) and *apraṭiṣṭhita* (non-host without parasites).¹

Every plant is of two kinds, viz. *pratiṣṭhita* and *apraṭiṣṭhita*. The *pratiṣṭhita* is that in which many *nigoda jīvas* (minute germs of life) exist besides the existence of one soul as principal in it. The *apraṭiṣṭhita* is that body where many *nigoda jīvas* do not exist under one single principal soul. The vegetables which grow from a root (*mūla*), from the shoot (*agra*) of a plant, from a joint (*parva*), from a bulb (*kanda*), from trunk (*skandha*), from seed (*bīja*) and vegetables which have no such seed as root, etc., (i. e., *saṁmūrcchima*) have been declared (to be) individual with host bodies (*pratiṣṭhita pratyeka*) or without them (non-host-*apraṭiṣṭhita*), e. g. ginger, rose-plant, sugarcane, potato, wheat, grass, etc.²

NIGODAŚARĪRA (MINUTEST BODY)³

The *nigoda-śarīras* become group-souled or gross (*bādara*.

1. Udaye du vaṇapphaḍīkamassa ya jīvā vaṇapphaḍī hoṁti Patteyaṁ sāmāṇaṁ paḍiṭṭhidiretti patteyaṁ, GS., Jīva., 185.
2. Mūlaggaporabījā khaṁdā taha khaṁdhabījābījaruhā Saṁmūccimā ya bhaṇiyā patteyaṇaṁtakāyā ya, Ibid., 186.
3. BhS., 25. 5. 749; Jainasiddhānta-bolasaṁgraha, Pt. II, pp. 19-21;

Anantānāmasumatāmekasūksmanigodhināṁ Sādhāraṇaṁ śarīraṁ yat sa nigoda iti smṛtaḥ, Lokaprakāśa, Sarga 4.33; See Jaina Jñāna Mahodadhi, pp. 33 ff; Jīvābhigama, 5. 233.

be five kinds of body of the worldly beings,¹ viz. audārikaśarīra, vaikriyikaśarīra, āhārakaśarīra, taijasaśarīra and kārmaṇaśarīra. (1) That which is born from the womb of mother is called audārikaśarīra (organic body of men and animals), (2) That which is possessed by the celestial beings or infernal beings, invisible to the sense of vision and capable of transformation in shape or size is called vaikriyikaśarīra (transformation body), (3) A subtle body which is developed by the highly spiritual yogins and can be thrown or impelled to great distances on special occasions is called āhārakaśarīra, (4) Taijasaśarīra is an electric or luminous body the existence of which has been established by the scientific experiments, (5) Kārmaṇaśarīra is the inner subtle body which forms the basis of all mental and physical activities. It corresponds to the liṅgaśarīra (subtle body) of the Sāṃkhya Philosophy. It accompanies Soul from birth to birth and it keeps Soul bound to the confines of the Universe because of the gravitational forces of matter encircling it on all sides. On the destruction of Karma-pudgala (karmic matter), Soul as a perfect eternal substance moves on fast with an impulse to the Siddhaśilā and exists there in its perfect state by attaining liberation.

Only the audārikaśarīra (organic body) is perceptible to the senses, as it is gross, whereas the other four are the subtle bodies; the one is subtler than the other by a gradual order,² but they are all corporeal.³ The first one is gross. The transformable body is finer than the gross one, the translocation-body is still finer than the transformable one. The luminous or electric body is still finer than the translocation or projectable body. And the karmic body⁴ is still finer than the luminous or elec-

1. BhS., 25. 4. 738; TS., II. 37.

2. Paraṃ paraṃ sūkṣmaṃ, TS., 2. 38.

3. Ibid.

4. Teṣāmaudārikādiśarīrāṇāṃ paraṃ paraṃ sūkṣmaṃ veditavyaṃ tadyathā audārikādvaikriyaṃ sūkṣmaṃ vaikriyādāhārakaṃ āhārakāttaijasaṃ taijasātkārmaṇamiti TS., Bhā., 2. 38.

tric body. Prior to the luminous body, each has innumerable times the number of space-points of the previous one.¹ That is, "the transformable body has innumerable times more than the number of space-points of gross organic one. The translocation body has innumerable times more than the number of space-points of the transformable one. The extent of the multiplying term is one/innumerable part of a palya. If so, the bodies must be successively greater in size. No. There is no difference in size owing to the nature of arrangement of structure, as in the case of heap of cotton and a ball of iron."²

"The last two (taijasa and kārmaṇa) have infinitesimal (space-points).³ The luminous body is infinitesimal in (space-points), when compared with the translocation body. And the karmic body is infinitesimal in space-points, when compared with the luminous body.⁴ The last two (taijasa and kārmaṇa-śārīra) are non-resisting (without impediment),⁵ i. e. there is no impediment for these two types of bodies, as these are of a fine nature,⁶ they can move upto the last border of the universe without resistance. Just as heat enters a piece of iron, the luminous and karmic bodies meet with no impediment in their transit through adamant sphere etc. Now, there is no impediment for the transformable and the translocation bodies also. It is true. But there is a difference. In the case of the last two bodies, there is no impediment anywhere upto the end of the

1. Padeśato asaṃkhyeyaguṇaṃ prāktaijasāt, TS., 2. 39, p. 197.

2. Teṣāṃ śārīrāṇāṃ paraṃ parameva, pradeśato asaṃkhyeyaguṇaṃ bhavati prāk taijasāt, audārikaśārīrapradeśebhya vaikriyaśārīrapradeśā asaṃkhyeyaguṇāḥ vaikriyaśārīrapradeśebhya āhārakaśārīrapradeśā, asaṃkhyeyaguṇāḥ—
TS. Bhā., 2.39, p. 197; SS., 2.38 (Comm).

3. Anantaguṇa pare, TS., 2. 40, p. 198.

4. Sarvārthasiddhi, 2.39; TS. Bhā., 2.40.

5. Apratighāte, TS., 2.14, p. 199.

6. Ete dve śārīre taijasakārmaṇe anyatra lokāntāt sarvatrapratighāte bhavaḥ, TS. Bhā., p. 199; SS., 2.40 (comm).

universe. But it is not so in the case of the other two, namely, the transformable and translocation bodies."¹

The taijasa and kārmaṇa śarīras (bodies) are of beginningless association.² "The association is beginningless as well as with a beginning. From the point of view of the series of cause and effect, the association is beginningless. From the particular point of view, it is also with a beginning as in the case of the seed and the plant. The gross, transformable and translocation bodies are associated with Soul at some time or other. But the luminous and karmic bodies are not so, on the other hand, these two are associated with Soul till the attainment of liberation."³ These two bodies are possessed by all the transmigratory souls.⁴ Some Ācāryas⁵ maintain from the stand-point of Nayavāda (consideration of one aspect of a thing) that there is a beginningless relation of the worldly souls with kārmaṇaśarīra only, but not with the taijasaśarīra, because of its production from labdhi (mental faculty) commencing with the luminous and karmic bodies, upto four bodies can be had simultaneously by a single soul.⁶ The karmic body is not the means of enjoyment.⁷ The gross body is of uterine birth and spontaneous generation.⁸ The transformable body originates by birth in aupapāda⁹ (heavenly special birth-beds); attainment is also the cause of its origin.¹⁰ The luminous body

1. SS., 2.40 (Comm).

2. Anādisambandhau ca, TS., 2.42; Tābhyām taijasakārmaṇābhyāmanādiḥ sambandhaḥ iti, TS. Bhā., p. 200.

3. Sarvārthasiddhi, 2.41.

4. Sarvasya, TS., 2.43., p. 200.

5. Ibid.

6. Tadādīni bhājyāni yogapadekasyā caturbhyaḥ, TS., 2.44, p. 202.

7. Nirūpabhogamantyaṁ, TS., 2.45.

8. Garbhasaṁmūrccanājamādyāṁ, Ibid., 2.46.

9. Vaikriyamaupapātikam, Ibid., 2.47.

10. Labdhipratyayaṁ ca, Ibid., 2, 48.

also is caused by attainment.¹ The projectable body, which is auspicious and pure and without impediment, originates in the saint of the sixth stage only.²

VĀK (SPEECH OR ORGANS OF SPEECH OR VOICE)

According to Jaina Philosophy, Vāk (Speech or Voice) is non-soul, corporeal, non-sentient and non-living material substance of the beings.³ The two-sensed beings and five-sensed beings receive matter by the sense of taste in the form of language, while the saṃjñin jīvas (those which possess consciousness to make a distinction between good and evil) receive infinite manovargaṇāyogyapudgalaskandhas (matters fit to turn into manovargaṇā=mind—dust—or particle) by manaḥpariṇāma (mental transformation).⁴ In the medicinal science also speech is regarded as material. (It comes out of the larynx or the organ of voice which is triangular box of cartilage and muscles, situated below the pharynx and the root of the tongue. It presents a considerable projection at the upper and front parts of the neck externally. At the upper part of the larynx there is a lid of cartilage called the epiglottis.⁵ The voice is generated by forcing air from the lungs through the space between two stretched vocal chords which are stretched across the trachea with a narrow vocal slit between them, the edges of the slit acting as

1. Taijaṣamapi, SS., 2.48 (Comm).
2. Śubham visuddhamavyāghāti cāhārakam caturdaśapūrva-dharasyaiva, TS., 2.49.
3. Goyamā no āyā bhāsā annā bhāsā, rūvi bhāsā no arūvi bhāsā...no sacittā bhāsā acittā bhāsā, no jīvā bhāsā ajīvā bhāsa Jivānam bhāsā no ajīvānam bhāsā, BhS., 13.7.493.
4. Dvīndriyādayo jihvendriyasaṃyogāt bhāsātvena gṛhṇanti nānye, saṃjñīnaśca manastvena gṛhṇanti nānya iti, TS., Bhā., p. 342.
5. Pysiology, p. 82.

reeds. The two vocal chords (membranes) are attached to muscles by which their tension and vibration frequently can be altered. The edges of the membranes are set into vibrations like reeds by the air from the lungs and thus sound is produced, the pitch of which can be altered by altering the tension of the vocal chords, and the quality of which depends upon the air cavities of the nose, throat and mouth, which act as resonators, the shape and the size of which can be varied by the speaker at will.¹ It is similarly explained in the Bhagavatī Vyākhyā-prajñapti that speech which is breaking forth, while speaking is speech, but not that which was spoken nor that which dies out after the crossing of the speaking time.²

There are stated to be two kinds of vāk (speech), viz. dravyavāk and bhāvavāk (physical and psychical speeches).³ Ācārya Pūjyapāda explains them in this way: There in the psychical speech is material, as it arises on the destruction-cum-subsidence (kṣayopāśama) of energy—obstructing karmas and sensory and scriptural knowledge—obscuring karmas, and on the rise of physique—making karmas of limbs and minor limbs. For in the absence of matter there can be no function of psychical speech. Matter prompted by the active soul endowed with this capacity takes the mode of speech. Hence physical speech is also material. Speech is the object of the sense of hearing.⁴ "It is perceived through the senses composed of matter, it is obstructed by material objects like the wall and the others, it is intercepted by adverse wind, and it is overpowered by other material causes."⁵

In support of his predecessor Akalaṅka deals with the subject by explaining that psychical speech, being the effect (kārya)

1. Int. Physics. S. C. Ray, Chaudhury and D. B. Sinha, p. 571.
2. BhS., 13.7.493.
3. Vāk dvividhā dravyavāk-bhāvavāgiti, SS., p. 286;
see Viśeṣāvaśyakabhāṣya, 336, 337, 351, 352, 353, 354,
375, 377; N. 5. 6, 8, 9.
4. SS., p. 286.
5. Ibid.

of Matter, is material (pauḍgalik) from the point of view of cause (nimitta)¹. It is material, for it is the object of the auditory sense, just as the thunderbolt, sparkling once, is destroyed again and does not become perceptible to the sense of vision, just so speech, once heard, is not heard again because of being broken forth. Just as inherent colour, taste, etc., even existing in the apprehensible fragrant substance, is not apprehended by the prāṇendriya (vital organ), just so sound also is not apprehended by the sense-organs like eye, etc.³

MANAS (MIND)

Manas (mind) has been accepted by all the Indian systems of thought as the internal sense-organ. There is a difference of opinions among the philosophers in regard to many aspects of it, such as, nature, cause, function, character (dharma), place (sthāna), etc. The Vaiśeṣikas,² the Naiyāyikas⁴ and their followers, the Pūrvamīmāṃsakas,⁵ have conceived manas as aṇu (atomic), hence it is eternal, i. e. devoid of cause. The Sāṃkhya-Yoga and their followers the Vedānta have not accepted it as aṇu; nevertheless, they have admitted it as atom-like and producible, as its origination takes place from ahaṇkāra,⁶ an evolute of Prakṛti or as avidyā. According to the Buddhist and Jaina philosophies, manas is all-pervasive, but not atom-like. Both these traditions accept it as having intermediate dimension and producible. The Buddhist philosophy maintains that manas (mind) is vijñānātmaka (consciousness-

1. Tannimittatvāt pudgalakāryatvādityarthaḥ, RV., p. 469.

2. Punaragrahaṇam taḍiddravyavadaśamhatatvāt, RV., p. 470.

3. Tadabhāvādaṇu manaḥ, VS., 7. 1. 23.

4. Na, yugapadānekakriyopalaḍbdeḥ...yathoktahetutvāccānu, NS., 3.2.57-59.

5. Prakaraṇapañcikā, p. 151.

6. Yasmāt karmendriyāṇi buddhīndriyāṇi ca sātvikādahaṇkā-rādutpadyante, mano'pi tasmādeva utpadyate, Māṭhara-vṛtti, kā. 27.

like) and it is the previous consciousness-like cause of the succeeding consciousness.¹ According to Jaina metaphysics, the physical mind is born of a kind of subtle-non-living substance called *manovarganās* (mind-particles) and it undergoes changes like the body at every moment, while the psychical mind, because of being characterized by the capacity of knowledge and being knowledge-like, is born of the sentient substance.²

All the Indian systems of thought hold the view that the function of *manas* is to cause the birth of the qualities like desire, hatred, pleasure, pain, etc., and their experience, whether these qualities exist in the soul or are of the intellect³ or self-evident, according to the theories of the *Nyāya*, *Vaiśeṣika*, *Mīmāṃsaka* and Jaina systems of thought, etc., or the doctrine of the Buddhist philosophy, respectively. *Manas* becomes the cause in the emergence of knowledge brought about by the external sense-organs and in the production of the qualities like knowledge, etc., which are born independently of the external sense-organs. According to the views of all the Indian Philosophies with the exception of the Buddhist view, the *dharma*s (characters or essentials) like desire, aversion, knowledge, pleasure, pain, impression, etc., do not belong to *manas*. The *Vaiśeṣikas* and the *Naiyāyikas*, the *Mīmāṃsakas* and the *Jainas* maintain that these qualities belong to Soul, but the *Sāṃkhya-Yoga* and the *Vedānta* hold the views that they belong to the intellect. The Buddhists have accepted *manas*

1. *Vijñānaṃ prativijñaptiḥ mana'āyatanaṃ ca tat. śaṇṇāmanantarātItaṃ vijñānaṃ yaddhi tanmanah*, Abh. K., 16-17; *Tattvasaṃgraha*, kā. 631; Abh. K., 1. 17 *Sphuṭārthā*, pp. 40, 41, vide *Darśana* and *Cintana*, p. 139.
2. *Tasmācittasya dharmā vṛttayo nātmanah*, *Sarvadarśana*, pāta, p. 35.
3. *Tāmrāparniyā api hṛdayavastu manovijñānadhātorāśrayaṃ kalpayanti*, Abh. K., *Sphuṭārtha*, p. 41, vide *Darśana* and *Cintana*, p. 140.

(mind) in place of the Principle of Self without regarding it as a separate entity, therefore, according to its view, all elements like desire, aversion, knowledge, force, etc. which are called *ātmadharmas* (essentials of soul) or *antaḥkaraṇadharmas* (essentials of internal sense-organ) by different philosophers are the elements of mind.

Some philosophies like the Nyāya-Vaiśeṣika and the Buddhist¹ accept *manas* (mind) as *hṛdayapradeśavartin* (existing in the space-point of heart), while other systems of thought like the Sāṃkhya, etc., hold the view that the place of *manas* (mind) cannot be stated to be *hṛdaya* (heart), because, according to their traditions, it is entering into the subtle body (*liṅgaśarīra*) which is itself a special body-like. It is known that the whole gross body should be accepted as the place of the subtle body; therefore, according to this tradition, the place of mind is decided to be the whole body. The Jaina tradition avers that the place of the psychical mind (*bhāvamāna*) is Soul only. But there is found the difference of opinion in regard to the physical mind (*dravyamāna*) among the Jinas. The Digambara tradition accepts the physical mind (*dravyamāna*) as existing in the smallest point of the heart, while the Śvetāmbara tradition maintains that the whole gross body is stated to be the seat of the physical mind (*dravyamāna*).²

So mind is of two kinds, viz. physical and psychical (*dravyamāna* and *bhāvamāna*). "The psychical mind characterized by the capacity (for comprehension) and consciousness is material, as it is assisted by matter. Similarly, owing to the destruction-cum-subsidence of knowledge-covering and energy-obstructing karmas and the rise of *nāma-karma* of limbs and

1. Abh. K. Sphuṭārthā, p. 41;

Vide Darśana and Cintana, p. 140.

2. Sarvārthagrahaṇaṁ tulanā, Pramāṇamīmāṃsā, p. 19, paṁti. 10 Sarvārthopalabdhaunendriyāṇi prabhavanti iti sarvaviṣayamantaḥkaraṇaṁ manaḥ, NBhā., 1. 1. 9; SK., 35; SS 2-11 (comm); SS., 5. 19 (comm).

minor limbs, particles of matter transformed into mind assist the living beings tending to examination of good and evil, remembering things, etc. Hence the physical mind also is material. It is contended by others that mind is a different substance that it is bereft of colour (form), etc., and it is of the size of an atom. Hence it is improper to consider it as matter.”¹ This is the Vaiśeṣika view on the concept of mind. Ācārya Pūjyapāda refutes this contention by advancing the argument whether the mind is connected with the senses and the soul or not. “If it is not connected, then it cannot be of assistance to the soul, nor can it be of use to the senses. If it is connected, then the atomic mind connected with one point cannot leave that point and be of use to the other parts (of the soul or the other senses). Nor can it be said to rotate like the potter’s wheel on account of an invisible force, as there can be no such capacity. The invisible force (*adr̥ṣṭa*) is admitted to be the attribute of the non-material and inactive soul. Hence it is also inactive. Being inactive itself, it cannot be the cause of activity elsewhere. For instance, the wind is endowed with activity and touch, and it is naturally the cause of the wafting of plants and trees. But this invisible force is quite different from it and hence it cannot be the cause of activity.”²

Bhāvamana is jñāna (knowledge), which is the attribute of Soul, so it comes under Soul. “As the physical mind is characterized by colour, taste, smell and touch, it is a modification of matter. The physical mind is characterized by colour, taste, smell and touch, for it is the cause of knowledge like the sense of sight.”³

Having followed the footsteps of Ācārya Pūjyapāda, Akalaṅka also deals with the concept of mind by refuting the Sāṃkhya, Buddhist and Vaiśeṣika views regarding it in his

1. Sarvārthasiddhi, V. 19 (comm.) Vide Reality, S. A. Jain p. 145.
2. Sarvārthasiddhi, p. 287.
3. Reality S. A. Jain. p. 131; Sarvārthasiddhi V. 3 (Comm)

own manner. He rejects the Sāṃkhya view of mind as the modification of the Prakṛti (Primordial Matter) by stating that when Prakṛti itself is non-sentient, then its modification also will be non-sentient, hence like jar, etc. it will not be able to perform the function like examining good or evil, remembering, etc. Mind is karaṇa (organ) of activity like thought. Then who will be the doer of this activity? Whether is it Prakṛti or Puruṣa (Self)? Puruṣa is attributeless, therefore, there cannot be the modification of Sattva (Essence) in it like thought, memory, etc. Prakṛti is non-sentient, hence there cannot be the sentient activities like thought, remembering, etc., in it also. Mahat (intellect), ahankāra (ego), etc., the modifications of Prakṛti, are different from it, then the postulation of the identity of effect and cause stands refuted. If it is non-different, then there remains only Prakṛti from which no modification is possible at all. Therefore, they cannot become mind.¹

Next Akalaṅka refutes the Buddhist theory of mind which is conceived as separate entity called vijñānarūpa (pure consciousness-like), i. e. that which is upādāna-bhūtajñāna-kṣaṇa (material cause of past knowledge-moment) of cognitions is called mind (manas). But in the Buddhist view, when jñāna (knowledge) is momentary, it cannot apprehend the object at the present moment; then what is to speak of the previous knowledge? When the present knowledge does not maintain any relation with the prior and posterior consciousness, then how can it examine good and evil, remembering, etc.?

Recognition of an object experienced by oneself is made by one who has seen it in the past, but there is no possibility of the recognition of the object experienced by others or that of the object unexperienced by himself. In the case of the advocates of momentarism this succession of remembrance (recognition) cannot take place. Santāna (issue or continuity) is non-substantial. Therefore, with regard to it there is no rational

1. Pradhānavikāra iti cet, na; acetanatvāt, TRV., V. 19 (comm)., p. 478.

ground for making the possibility of remembrance, etc. When *pūrvajñānarūpamāna* (previous knowledge-like mind) is non-existent at the present time, then how can it perform the functions like examining good and evil, remembering, etc.? If the seed-like store-house of consciousness (*ālayavijñāna*) is accepted as permanent, then the doctrine of momentariness stands refuted. If it is momentary, then it cannot also be the support of remembrance, etc.¹ Akalaṅka has followed the same procedure of his predecessor Ācārya Pūjyapāda for refuting the Vaiśeṣika view of mind.²

In modern psychology mind has been conceived as physical and psychical, just as it is accepted in Jaina Philosophy, as the evolution-theory demands and mind-dust.³ William James makes "the assumption that our mental states are composite in structure, made up of smaller states con-joined."⁴ "Theory of 'mind-stuff' is the theory that our mental states are compounds, expressed in its most radical form."⁵ "Each atom of the nebula...must have had an aboriginal atom of consciousness linked with it; and just as the material atoms have formed bodies and brains by massing themselves together, so the mental atoms, by an analogous process of aggregation, have fused into those larger consciousness which we know in ourselves and suppose to exist in our fellow-animals."⁶ So according to this doctrine of atomistic hylozoism, "there must be an infinite number of degrees of consciousness, following the degrees of complication and aggregation of the primordial mind-dust."⁷ This mind-dust can be compared well with

1. *Vijñānamiti* cet, na; that *sāmarthyābhāvāt* (32), RV., pp. 472-3.

2. RV., pp. 471-472.

3. *The Principles of Psychology*, pp. 145. ff.

4. *Ibid.*, p. 145.

5. *Ibid.*

6. *Ibid.*, p. 147.

7. *Ibid.*

manovargaṇās, which constitute manas (mind) as conceived in Jaina Metaphysics. The comparative study of these brief outlines of the Indian concepts of mind reveals that the Jaina concept of mind has made a synthetic approach to this problem from the physical and psychical points of view like modern psychology.

PRĀṆĀPĀNA (RESPIRATION)

Prāṇāpāna (respiration) is material. Ācārya Pūjyapāda explains the point in this manner "The soul wishing for the destruction-cum-subsidence of energy-obstructing karmas and the rise of nāma-karmas of limbs and minor limbs, exhales air from the lungs, and it is called the breath of life (prāṇa). The same soul inhales air from the atmosphere and it is called the breath of inhalation (apāna). Thus these also are helpful to the soul, as these enable the soul to live."¹ The exhaled air and inhaled air must be understood to be material. They meet with resistance, etc., by objects. Respiration is obstructed by covering the face with the palm or cloth. It is also obstructed by phlegm. But a non-material substance cannot be obstructed by material objects.

In the medical science also the Jaina view of the material nature of respiration is fully supported. The respiratory apparatus consists of the larynx, trachea, bronchi, lungs and pleurae.² When one breathes in air, it goes through the trachea and bronchi to the air-sacs of the lungs, which are surrounded by blood capillaries. "According to the property of diffusion the oxygen inside the alveoli and the carbon dioxide in the capillaries interchange themselves through the thin membranes. As the oxygen inside the alveoli is taken by the blood, the air inside the lungs must be renewed to bring in a fresh supply of oxygen and the waste products, such as, carbon dioxide must

1. SS., V. 19 (comm).

2. Human Anatomy, p. 1016.

also be thrown out of the body.”¹ The first process by which one breathes in air is called inspiration, i. e. the Jaina ‘apāna’, and the second one by which the impure air inside the lungs is thrown out is called expiration which corresponds to the Jaina ‘prāṇa’. This combined process of inhaling and exhaling air is called respiration, i. e. the Jaina ‘apāna and prāṇa’. The absorption of oxygen by the red corpuscles of the blood and the removal of waste products, such as, carbon dioxide and water, take place in the lungs by this process of respiration.

1. Human Anatomy, p. 1016.

SECOND SECTION

MANIFESTATIONS AND MODIFICATIONS OF MATTER

Manifestations of Matter take the forms of śabda (sound); bandha (combination), sauṣṭmya (fineness), sthauṛya (grossness), saṁsthāna (shape or figure), bheda (division), tamas (darkness), chāyā (shadow), ātapa (sun-shine, heat) and udyota (moonlight, cool light).¹

Śabda (Sound)—The cause of śabda (sound)—natural or artificial, has been pointed out to be the striking of molecules (skandhas) against one another, i. e. "sound is generated by molecules when they strike one another, which may be natural or artificial (hence sound may be indirectly associated with atoms also)."²

According to the Sāṁkhya Philosophy³, śabda (sound) is tanmātra (infra-atomic or potential energy) which generates ākāśa (ether), because of being a radicle or centre encircled by masses (Bhūtādi), while the Vaibhāṣika school⁴ of the Buddhists maintains that śabda (sound) as an object of the sense of hearing is one of the fifteen kinds of Rūpa (Matter). The Nyāya-

1. Śabdabandhasauṣṭmyasthauṛyasamsthānabheda tamaschāyā-
ātapodyotavantaśca, TS., V. 24; Saddāndhayāra ujjoo,
pahā chāyā ātavo i vā, Uta., 28. 12;
Saddo bamidho suhamo thūlo samsthāna bhedatamachāyā.
Ujjodādasahiyā puggaladavvassa pajjāyā, DS., 16.
2. Saddo khamdhappabhavo khamdho
paramāṇusaṁgasamghādo
Puttesu tesu jāyadi saddo uppādayo niyado, PS., 86.
3. The Positive Sciences of the Ancient Hindus, p. 26;
Ṣaḍviśeṣāḥ tadyathā śabdatanmātram etc., Vyāsabhāṣya,
Sūtra 19, pāda II;
Ahaṅkārad-śabdatanmātram...etc., Pravacanabhāṣya,
Ch. I, Sū. 62.
4. Śabdasānye nava dvidhā, Abh. K. I. 34.

Vaiśeṣika conceived śabda (sound) as the quality of ākāśa (space or ether).¹ The Mīmāṃsakas of the Bhaṭṭa school accept śabda (sound) as a substance on the basis of the fact that it is perceived independently and directly and it exists as a self-subsistent real and it does not have the criterion of quality of being perceived invariably as dependent upon a substance substratum.²

The Mīmāṃsaka view of dependence is refuted by the Nyāya-Vaiśeṣika on the ground that the perception of substance is not the essential pre-condition of the perception of quality and the dependence of quality upon the substance is not the exclusive criterion of a quality because every positive real except an eternal substance is dependent upon some substratum for its very existence.³ The Nyāya-Vaiśeṣika maintains that whatever possesses a universal (jātimat) and is cognizable by some external sense other than the visual sense, is a quality.⁴ Therefore, sound (śabda) is a quality.⁵ It is not an incomposite

1. Śabdalingaviśeṣādviśeṣalingabhāvācca, VS., II. 2. 30; Tatrākāśasya guṇāḥ śabdasaṃkhyā, PPBhā., p. 23.
2. Viyadguṇatvam śabdasya kecid ūcurmanīṣiṇaḥ, pratyakṣādivirodhaḥ, tad-Bhaṭṭapādairupekṣetaṃ, tatra guṇasya sarvatra sāśrayatāpratyamānatvād iha ca nirāśrayatayai'va pratitidarśanāt pratyakṣavirodhaḥ .śabdo dravyaṃ sattve satyanāśrayatvāt kālavat, Mānameyodaya of Nārāyaṇa Bhaṭṭa, ed. Trivandrum, 1912, p. 91.
3. Āśritatvam cā'nyatra nityadravyebhyaḥ, PPBhā., p. 16, cf. Āśritatvam guṇatve hi na prayojakaṃ iṣyate saṃnāmapi padārthānām āśritatvasya sambhavāt. Dikkālaparamānvādinityadravyātirekiṇaḥ āśritaḥ sad-āpīṣyante padārthāḥ kaṇabhojinā, NM., Pt. I, p. 210.
4. Studies in Nyāya-Vaiśeṣika Metaphysics, p. 167.
5. Bāhyendriyāgrāhyatvena pratibandhāt, Śabdo guṇo jātimattve sati asmadādibāhyacākṣuṣapratyakṣatvāt gandhavat

substance nor a composite one, for the incomposite substance, e. g. atom, or space, or time, or soul, is intangible to the external sense.¹ It is eternal because of being uncaused, but sound is non-eternal, for it is generated under specific conditions.² It is stated to be the product having *Ākāśa* (ether or space) as its constitutive substratum. But the idea that "substance produced by and inhering in a single substance is inconceivable, since one of the conditions of production, viz. the conjunction of constitutive factors, which is the *asamavāyikāraṇa*, is lacking."³ Hence sound is not a substance. According to the *Nyāya-Vaiśeṣika*, it is the specific quality of *Ākāśa* (space or ether).

According to the physical sciences, sound as the manifestation of Matter is conceived as energy of it. This view is identical with the Jaina conception of sound as the manifestation of *Pudgala* (Matter). It "usually originates in vibrating bodies and that the vibrations are transmitted through the surrounding elastic medium, usually air, as wave motion of the longitudinal type. When the compressional sound waves are passing through air, the amplitude of the vibratory motion of the layers of particles is surprisingly small, being only about 10^{-8} cm for a sound that is barely audible."⁴ This view of the origination of sound as explained in the physical sciences is

yadi tu niravayavadravyaṃ syāt bāhyendriyagrāhyaṃ na syāt niravayavadravasya, NLV., pp. 274-5; SM., pp. 190-1.

1. NLV and NLVK., p. 275.
2. *Anityaścāyaṃ kāraṇataḥ*, VS., II. ii. 28;
*Kāraṇata utpatterdṛṣṭatvāditi śeṣaḥ upalabhyate hi bherī-
daṇḍasaṃyogādibhyaḥ prādurbhavan śabdaḥ, tathā cot-
pattimattvādanityo ayamiti yadvā kāraṇata iti kāraṇavattva-
hetumupalakṣayati*, VSU., Ibid.
3. *Ekadravyatvānna dravyaṃ*, VS., II. ii. 23; see *Studies in
Nyāya-Vaiśeṣika Metaphysics*, p. 169.
4. *Physics—Principles and Application*, 38, 1, p. 560.

similar to the Jaina view of the generation of sound as a result of the striking of molecules against one another.

Kinds of Śabda (Sound) : According to Jaina metaphysics, there are mainly two kinds of sound, viz. bhāṣātmaka (sound incorporated in languages) and abhāṣātmaka (sound which does not find place in languages)¹. The former is sub-divided into two kinds, viz. akṣarātmaka (articulate utterance of speech) and anakṣarātmaka (sound made by creatures or by the Kevalins),² while the latter is also of two kinds, viz. prāyogika (sound produced by human beings with the help of musical instruments, i. e. musical sounds) and vaisrasika (natural sounds, such as, the roaring of the thunder or the rippling of water and the noises in general)³. The prāyogika śabda (artificial or applied sound) is further sub-divided into four kinds, viz. tata (musical sound of table or drum, i. e. a stretched membrane), vitata (musical sound of stringed instruments), ghana (musical sound produced by reed instruments, such as, harmonium, sound from bell) and suṣira (sound produced from wind instruments, organ pipes or conch)⁴.

According to modern accoustics, sound is divided into two classes, viz. musical sounds and noises. Prāyogika śabdas of Jaina metaphysics, viz. tata, vitata, ghana and suṣira correspond to the musical sounds of modern physics, while vaisrasika śabdas (natural sounds), such as, roaring of thunder, etc., include the noises—sounds of modern accoustics. Bhāṣātmaka-śabda (sound incorporated in languages) forms a distinct class by itself, but it may be placed under the category of the noises of modern accoustics. The subdivisions of musical sound into the vibrations of membranes, strings, rods and plates and air columns of the physical sciences correspond respectively to the

1. Śabdo dvedhā bhāṣālakṣaṇaviparītatvāt, RV., p. 485.
2. Bhāṣātmaka ubhayathā akṣarīkṣetaravikalpāt, Ibid., p. 485.
3. Abhāṣātmako dvedhā prayogavisrasā nimittatvāt, Ibid., p. 485; Tatra vaisrasiko valāhakādiprabhavaḥ, Ibid.
4. Prayogaścaturdhā tatavitataghanasuṣirabhedāt, RV., p. 485.

following kinds of sound of Jaina metaphysics, viz. tata, vitata, ghana and suṣira.

PITCH, INTENSITY, QUALITY AND WAVE OF SOUND AND ITS PROPAGATION

It is explained that Bhāṣā (sound incorporated in languages or speech) is of the beings, it originates from the body, it is of the shape of vajra (thunderbolt) and it reaches the last border of the universe.¹ Bhāṣā having originated from the body, breaks forth by two samayas (instants). There are stated to be mainly two kinds of Bhāṣā viz. paryāptika (developed) and aparyāptika (undeveloped). Paryāptikabhāṣā has been sub-divided into two kinds, viz. satyabhāṣā (true language) and mṛṣābhāṣā (wrong or false language). They are again divided and sub-divided into many kinds, such as, janapadasatya, samyagsatya, sthāpanāsatya, nāmasatya, rūpasatya, etc. In reality there are two kinds of Bhāṣā, viz. dravyabhāṣā (physical speech) and bhāvabhāṣā (psychical speech)². Dravyabhāṣā is sub-divided into the following groups, viz. grahaṇam (speech received by the self through transformation), nihsaraṇa (that which is emitted by the action of lungs, throat, etc.) and parāghātabhāṣā (speech sent out by the action of transformation by those emitted physical vocal substances). Beings receive bhāṣā-

1. Bhāṣā naṃ jīvāiyā sarīrappabbhavā, vajjasamṭhiyā, logamtapajjavasiyā paṇṇavattā—Paṇṇavanā, Bhāṣāpada, ii, 386.
2. Paṇṇavanā, Bhāṣāpada, 387, 388-90;
Nāmāī-nikkhevā, cauro caurehi ettha nāyavvā
Davve tivihā gahaṇam tahaya nisiraṇam parāghāyo, BR., 2;
Pāhannaṃ davvassa ya, appāhannaṃ taheva kiriyāṇam
Bhāvassa ya ālambiya, gahaṇāisu davvavavaeso, BR. 11;
Uvauttānam bhāṣā, nāyavvā ettha bhāvabhāṣatti
Uvaogo khaḷu bhāvo, nuvaogo davvamitti kaṭṭu, BR. 12.

dravya (vocal substance or speech-substance) from six directions.¹ The *niḥsaraṇadravya-bhāṣā* identical with the voice or speech of the medical science emitted by the beings.

Intensity of Emitted Speech (Bhāṣā) : *Bhāṣā* breaks forth with gentile efforts, i. e. with low intensity; some speeches are emitted with intense effort and some are unbroken, i. e. continuous. The broken (emitted) speeches go to the last border of the Universe, getting increased and increased infinitfold. That is to say, some healthy speaker emits *bhāṣādravya* (speech-substances or vocal substances) with intense effort out of liking and they are broken forth into parts by the efforts of receiving and throwing out matters, while some sick person emits gross particles of unbroken (continuous) speech-substance with gentle effort out of disliking. These particles of unbroken speech-substance, getting increased infinitfold on account of fineness and manifoldness and association with other material substances go to the last borders of the Universe in six directions, i. e. spread to the last borders of the Universe.² In other words, a

1. Goyamā ṭhiyāim giṇhai, no aṭṭhiyā im giṇhai...davvao vi giṇhai khettao vi kālao vi, bhāvao vi giṇhai, PV., *Bhāṣā-pada*, 11. 395;
Bhāṣakānām niyamātttrasanādyā mavasthānena teṣāṃ saḍḍiggaḷānāṃ eva pudgaḷānāṃ grahaṇasāmbhavāt, ālāpakaś-cātra prajñāpanāyāmevānusandheyaḥ, Bhāṣārahasya, Tīkā, p. 2.
2. Puṭṭhaṃ suṇei saddaṃ rūvaṃ puna pāsai aputṭhaṃ tu... (336) ni. 5, p. 130;
 chikkāim ciyaṃ giṇhai saddadavvāim (337) Jaṃ tāim *Bhāṣā samaseḍḍhi*o saddaṃ Jaṃ suṇai mīsayam suṇai *Vīseḍḍhi* puṇa saddaṃ suṇai niyamā parāghāe 35, Ni 6 *Seḍḍhi paesapaṃti vadato savvassa saddisiṃ tāo jāsu vimuttā dhāvai bhāṣā samayammi paḍhamammi* (352) *Bhāṣāsamaseḍḍhiṭṭhi*o tabhāṣāmiṣiyam suṇai saddaṃ taddavvabhāviyāim annāim suṇai vidisattho (353) *Anuseḍḍhigamaṇāo paḍighāyābhāvo animittāo*

being emits speech-substances which it receives for speaking as broken and unbroken (*bhinna* and *abhinna*).¹ Those speech-substances, being emitted, touch the last borders of the Universe, getting increased and increased infinitesimal. The unbroken speech-substances, having crossed countless points of immersion, breaks forth and having gone to countable *yojanas* die out² in the horizon.

Parāghāta Bhāṣā-dravya : There takes place the force (*vāsanā*) called *parāghāta* (impact or striking=wave) of the *prayoga-vāsanā-yogya-dravyas* (speech-substances pronounced with the efforts of palatals, etc.). That *parāghātabhāṣā* is emitted as being generated by the striking of speech-substances against one another out of straight line (i. e. in a curved line) due to the fineness of emitted speech-substa-

Samayaṃtarāṇavatthāṇao ya mukkāim na suṇei (354)

Tivhammi sarīrammi Jivapaesā havaṃti Jivassa

Jehi ugeṇhai gahaṇaṃ to bhāṣai bhāṣao bhāṣaṃ, ni 8

Oraliyaveuvviya āhārao geṇhai muyai bhāṣaṃ saccam

saccāmosaṃ ca asaccāmosaṃ ca (375), ni 9

Anahigayā jā tisu vi saddo ciya kevalo accasusā

eyā sabheyalakkhaṇa sodāharaṇā jahā sutte (377)

V. Bhāṣya.

Bhinnāi koi nisirai, tīvvaṇpayatto paro abhinṇāim

Bhinnāi jānti logaṃ aṇaṃtaguṇavuddhijuttāim, Bhāṣārahasya, 5;

Goyamā ! bhinnāim pi nisirai abhinnāim pi nisirai jāim

bhinnāim nisirai tāim aṇaṃtaguṇapārivuddhie parivuddha-

mānāim loyaṃtaṃ, phusaṃti, Paṇṇāvanā, Bhāṣāpada,

11. 398.

1. PV., Bhāṣāpada, 11. 398.

2. *Bhijjānti abhinnāim, avagāhaṇavaggaṇā asaṃkhijjā gaṃtuṃ vā joyaṇāim, saṃkhijjāim vitijjānti*, Bhāṣārahasya, 6; *Jāim abhinnāim nisirai tāim asaṃkhijjāo ogāhaṇavaggaṇāo gaṃtā bhedamāvajjānti saṃkhejjāim joyaṇāim viddham-samāvajjānti*, Paṇṇāvana, Bhāṣāpada, 11. 398.

nces from the going in a straight line (annśreṇi-avagāhanā). Paraghataline (sama bhāṣā-kaṭigapekṣa-pradhvarā śreṇi). So it is stated in the Niryukti that parāghātabhāṣā goes in a curved line.¹

In regard to the propagation of sound the early Nyāya-Vaiśeṣika philosophers maintain that the first sound, generated by the impact of vibrating molecules of sonorous bodies against contiguous molecules of air in the substrate Ākāśa² generates sound in the contiguous Ākāśa and the second sound a third sound and so on, just as waves produced in water or ocean, until the last sound causes a vibration in the ear-drum (kaṇa-śaṣkuli). This propagation of sound is effected by the air-wave as its carrier. Ākāśa is immobile, but the air-wave is not transmitted without the inter-connecting of air-molecules by Ākāśa. Udyotakara³ holds the view that the first sound

1. Bhāṣā samasedhio saddaṁ jam suṇai mīsayam suṇai
Viśeḍhi puna saddaṁ suṇci niyamā parāghāe,
Bhāṣārahasya, 10.
2. Śabda ambaraguṇaḥ saṁyogavibhāgaḥ śabdajaḥ...sthāna-
vāyusaṁyogāpekṣamānāt sthānākāśasaṁyogāt varṇotpattiḥ
avarṇakṣaṇo api bherīdaṇḍasaṁyogāpekṣāt bheryākāśa-
saṁyogāt utpadyate, PPBho., p. 156;
Veṇu parvavibhāgāt veṇvākālavibhāgācca śabdācca saṁ-
yogavibhāganiṣpannāt vīcīśantānavat śabdasantāna ityekam
santānena śrotrapradeśamāgatasya grahaṇam, Ibid.,
Vīcīśantaramupajāyate tato apyanyat tatopyanyadityanena
kramēṇa vīcīśantāno bhavati, nanveṣa kalpanā kutaḥ
siddhyatītyāḥ, etc. NK. p. 157.
3. Pariśeṣāt tu santānasiddhiḥ/tatrādyāḥ śabdaḥ saṁyoga-
vibhāga hetukaḥ/tasmāt śabdāntarāni kadambagolakānyā-
yena sarvadikkāni tebhyaḥ pratyekamekaikaḥ śabdaḥ
mandataratamādīnyāyenāśraya pratibandhamanuvidhīya-
mānaḥ prādurasti, tato antyasyātimāndyāt śabdāntarotatti
śaktivighāto yena pratibandhāt bhavati,
Udyotakara, 11.2.14, NV., p. 286.

produces indefinite number of sounds in all directions, not one sound in a circle; each of them generates again another one and so on, in such a way that sound expands by successive concentric spherical layers, just as kadambakoraka (bud of the Nancha Kadamba) expands by successive concentric spherical layers of filaments, shooting forth from one another. Of these two hypotheses the first air wave implied in the transmission of sound is of the transverses waves, while the second is of longitudinal waves. In the orthodox Mīmāṃsaka view of Śābarasvāmin the air-wave forming physical sound signifies a series of conjunctions and disjunctions of air-particles with rarefaction and condensation and suggests longitudinal waves.¹ Sound dies out at last with the growing of the momentum of the impact of series feebler and feebler in the course of transmission of sound through the air-particles. Another view is that the propagation of sound is not effected from molecule to molecule, but it spreads in ever expanding circles, just as evidenced in water-waves, perhaps in spherical layers by the compression of masses of air, the waves of which are very fast.² There is a striking similarity between the Jaina view and the Nyāya-Vaiśeṣika theory on the wave of sound and its propagation. Both of them agree on the point that sound becomes refracted as well as diffracted according to the cause of its generation. It increases infinitesimal on account of fineness and manifoldness and association with other substances, like air, etc., and expands in all directions and go to the last borders of the Universe. The unbroken (continuous) sound attains division and dies out at last; after crossing countable distance with the growing of the momentum of the impact of series

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1. Vicitarāṅganyāyena tadutyabhittistu kīrttita kadambakorakanyāyādutpatti kasyacinmate, Bhāṣāpariccheda, Śl. 165, Viśvanātha.
 2. Yathā, 'ādyasābdena kadambagolakavad daśadīśi daśasābdā ārambhante taiśca daśasābda-santānā iti, Tattvacintāmaṇi, Gaṇeśa.

feebler and feebler. But there is the difference between the two views on the fundamental point that sound is accepted as the quality of Ākāśa in the Nyāya-Vaiśeṣika Philosophy, while it is conceived as the manifestation of Matter in Jaina metaphysics.

The Jaina theory of wave of sound and its propagation is well supported by modern physics. It is explained that "sound waves, of course, exhibit the properties of reflection, refraction, and diffraction characteristic of all forms of wave motion. Such behaviour of sound waves may be rendered visible by the method of spark photography. The waves passing before the photographic plate are illuminated for a brief interval by a timed electric spark. The slight increase in density in the condensation in the wave front causes some refraction of the light and thus produces a shadow in the photograph."¹

"If a train of waves is filling a medium, a surface connecting at a given instant all particles which are in the same phase of vibration constitutes a wave front. In the case of sound waves in air, the vibrating source being quite small, such a surface will be spherical; and if the distance from the source is large, a small portion of this spherical wave front may be considered as a plane wave. If the medium is homogeneous and isotropic, the direction of propagation is always at right angles to the wave front."²

"The behaviour of the wave fronts as a uniform medium, bends around obstacles (diffraction), rebounds from a surface (reflection), or changes direction when entering a new medium (refraction) may be predicted by using a simple method first proposed by Huygens (1629-1695), a contemporary of Newton."³ According to his principles, "every point on a wave

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1. Physics—Principles and Applications Margenau, Watson and Montgomery, 38, 1, p. 560.
 2. Physics—Principles and Application, p. 552.
 3. Ibid.

front may be considered to be a new source of disturbance from which spherical wave-lets issue.”¹ Here is the point which is explained by Jaina philosophy in this way that *parāghāta bhāṣādravyas* (generated sound-particles or waves by striking) increase infinitesimally and expand and go in a straight line, a curved line and a parallel line or in mixed line to all directions.

BANDHA (BINDING)

Bandha is the binding of various forms of substance by the force of which they draw together and stick. It is of two kinds, viz. *vaisrasika* (natural) and *prāyogika* (mechanical or that brought about by human efforts). The first one is caused by the mixture of smooth and rough particles of matter (i. e. positive and negative electric charges) in lightning, meteoric showers, rainfall, fire, rainbow, etc. The second one is twofold combination of non-living things and combination of living and non-living substances, as for instance, the combination of non-living things, resin, wood and so on. *Jīvāṅgavaiṣayabandha* (combination of living and non-living objects) may result from (i) karma producing eight kinds of bondage corresponding to eight kinds of karma, viz. (i) *jñānāvaraṇīyakarma* (knowledge-obscuring karma up to *antarāyakarma* (energy-hindering karma) and (ii) no-karma (which aids the fruition of karmas), which is classified into *ālāpana* (fastening of a rope,

1. Physics—Principles and Applications, p. 552.

Reflection of Waves; “The law of reflection for a wave front incident upon a smooth obstructing surface may be obtained by application of Huygens’ principle (Physics, p. 553) Refraction of Waves; “When a wave front passes obliquely from one medium into another in which it travels with a different velocity, its direction will change. This is the phenomena of refraction.” Ibid., p. 556.

or chain to a chariot), ālepana (painting the wall, etc.) saṁśleṣa (joining of pieces of wood together by a carpenter), śarīra-bandha (the binding of limbs in a body) and śarīri-bandha (the binding of different bodies).¹

Vaisrasikabandha (natural binding or combination) is either anādi (beginningless), i.e. the binding combination of the whole mass or Dharma (principle of motion), Adharma (principle of Rest) and Ākāśa (Space), or ādimat (that which has a beginning because of its origination from a definite cause), e. g. the combination of different colours, in a rainbow, production of lighting, the shooting stars, and the formation of clouds. The whole of half of a quarter of each Dharma, Adharma and Ākāśa (Principles of Motion, Rest and Space) may be said to contain different parts which are attached to another. Thus there are nine kinds of binding or combination which are eternal.² Besides, there is miśrabandha (prayoga-vīrasā), e.g. bandha (binding) of pillar, jar, etc., caused by human effort and non-living material substances.³

1. Goyamā ! duvihe baṁdhe paṇṇatte, taṁjahā—paogabaṁdhe ya vīrasā baṁdhe ya ; vīśāśābaṁdhe . duvihe paṇṇatte, taṁjahāsāiya-vīśāśābaṁdhe ya anāiya-vīśāśābaṁdhe ya, etc., BhS., 8.9. 344-347;

Khaṁdho' api dvedhā visrasāprayogabhedāt, adya dvedhā ādimadanādivikalpāt, visrasā vidhiviparyaye nipātaḥ prayogaḥ purusakāyavānmanasamyogalakṣaṇaḥ prāyogikaḥ sa dvedhā ajīvaviśayo jīvājīvaviśayaśceti jīvājīvaviśayaḥ karma no-karmabandhaḥ karmabandho jñānāvaraṇādīraṣṭā, no-karmabandhaḥ paricavidhaḥ—ālapanālepanasamsleṣa-śarīraśarīri bheḍāt", RV., V. 24, 6,7.8.9; p. 487.

2. Kṛtsno dharmāstikāyaḥ tadardhaṁ deśaḥ ardhārdhaṁ pradeśaḥ evaṁ adharmākāśayoḥ, dharmādharmākāśanāmekāśaḥ traividhyānnavavidhaḥ, RV., V. 24. 7, p. 487
3. Prayogavisrasābhyām jīvaprayogasahacāritācetanadravya-pariṇatīlakṣaṇaḥ stambhakumbhādirmiśraḥ, TS., p. 360.

OTHER MANIFESTATIONS OF MATERIAL SUBSTANCE

Saukṣmya (Fineness) : Saukṣmya is the subtle manifestation of the material substances. It is of two kinds, viz. antya (absolute or extreme) and apēkṣika (relative). Antya (extreme fineness) is found in indivisible ultimate atoms. Instances of relative fineness are the wood apple, myrobalan, plum, etc.¹

Sthaulya (Grossness) : Sthaulya is the gross manifestation of the material substances. It is also of two kinds, viz. antya (absolute or extreme) and apēkṣika (relative). The example of extreme grossness is the biggest molecule of matters pervading the entire Universe, while the instances of relative grossness are the plum, myrobalan, wood apple, palmyra fruit, etc.²

Samsthāna (Shape) : Samsthāna is the shape of the material substance. It is of two kinds, viz. ittham (that which can be defined) and anittham (that which cannot be defined). The regular geometrical shapes or figures, such as, circle, triangle, rectangle, square, globe, etc., are the instances of the first variety. The clouds, etc., may be of various irregular shapes, which cannot be exactly described. They are the instances of the second variety.³

Bheda (Division) : Bheda is the division of the material substances. It is of six kinds, viz. utkara (e. g. sawing a piece of wood), curṇa (e. g. grinding barley and wheat into flour), khanda (e. g. breaking up of pitcher into different potsherds), curṇika (e. g. separating the chaff from rice, pulses, etc.) pratara (e. g. dividing mica into many layers or slices) and

1. Tatrāntyaṃ paramānūrāṃ, āpekṣikaṃ bilvāmalakabadarādīnāṃ, SS., 5. 24 (Comm), See RV., 5.24; 10; p. 488.
2. Sthaulyamapi dividham antyamāpekṣikaṃ ceti tatrāntyaṃ jagadvyāpinī mahāskandhe āpekṣikaṃ badarāmalakabilvātālādīṣu, Ibid., See, RV., p. 488.
3. BhS., 25. 3. 723; SS., p. 296.

anucatana (e. g. causing spark of fire to fly out from a glowing ball of iron, etc.)¹

Tamas (Darkness) : As pointed out before, Tamas (darkness) is conceived as material in Jaina metaphysics. Besides, the Jaina view regarding it has been supported by the Vedic and Buddhist works. In the Jaina Āgama Bhagavati Vyākhyā-prajñāpti it is stated that "Day is bright and night is dark (Diya ujjo rātiṃ aṃdhayāre), because in the day time there is auspicious matter, the transformation of which is auspicious, while at the night time there takes place the transformation of inauspicious matter."² Here the purport of this statement is this that both light and darkness are material. Ācārya Pūjyapāda has defined Tamas as the antithesis of light and the cause of obstruction to vision.³ It is not the negation of light. In the physical sciences also it has been demonstrated that there exist infra-red rays in complete darkness and "they can be perceived by the eyes of a special photographic plate." "In the absence of these dark rays it is not possible to have photography in pitch darkness."⁴

Chāyā (Shadow) : Chāyā (shadow) results from the obstruction of light by an object. The Vaibhāṣika school also accepts chāyā (shadow) as Rūpa (matter) having colour and shape. It is of two kinds, viz. images as seen in a mirror and unverted images like shadows. In the first instance of these two the left side becomes right and the right side becomes left.⁵ The produc-

1. Paṃḍavihe bhee paṇṇatte taṃjahā khaṃdabhee payarābhee cūṇṇiyābhee aputaḍiyābhee, ukkariyābhee, etc., PV., 399-400; SS., p. 296.

2. Diyā subhā poggalā subhe poggalapariṇāme rātiṃ asubhā poggalā asubhe poggalapariṇāme, BhS., 5. 9. 224.

3. Tamo dṛṣṭipratibandhakaraṇaṃ prakāśavirodhi, SS. 5.24 (Comm).

4. Cosmology Old and New, p. 195.

5. Chāyā prakāśāvaraṇanimittā sā dvedhā, varṇadivikārapariṇatā pratibimbamātrātmikā ceti, SS, 5. 24 (Comm).

tion of shadow is explained by the physicists in the following manner. "An opaque obstacle in the path of the rays of light casts a shadow because the rays are obstructed and are unable to enter casts a shadow because the rays are obstructed and are unable to enter the region of the shadow. The images formed by lenses and mirrors are of two kinds called virtual and real. The example of a virtual image is the image seen in a looking glass, whereas the example of the latter is the images in a cinema screen. In the case of virtual image the rays appear to come from the image, whereas in the case of a real image, the rays do actually come from it, i. e. energy manifests itself in the form of shadows and images, virtual and real."¹ The Jaina conception of *chāyā* (shadow) differs from that of modern physics, for the Jainas accept *chāyā* as material on the ground that it is apprehensible to the sense of sight with its colour and shape, while modern physics holds the view that an opaque obstacle in the path of the rays of light casts a shadow, as the rays are obstructed on its way to the entry into the region of the shadow.

Ātapa (warm light or heat, sunshine) and *Udyota* (cool light, moonlight etc.)

Ātapa is heat and light combined emanating from the sun, fire, etc.² while *udyota* is light emitted by the moon, the fire-fly (glow worm), jewels, etc.³ It is a well known fact in the Jaina system of thought that the sunrays and moon-light are natural. They make space bright, cause to shine and make it hot and illustrious by their respective lights in six directions.⁴ Some hold the view that the sunrays are sometimes resisted by

1. *Cosmology Old and New*, pp. 88-89.

2. *Ātapa ādityādinimitta uṣṇaparakāśalakṣaṇaḥ*, SS., p. 296.

3. *Udyotaścandramaṇikhadyotadiprabhavaḥ prakāśaḥ*, SS p. 296.

4. *BhS.*, 8. 8. 344; *Sūriyapaṇṇatti*, 3. 24, 25, 26, 28; *Canda paṇṇatti* 28.

matters which come into contact with it.² This division of prakāśa (light energy) into ātapa (warm light) and Udyota (cool light) is made on a scientific basis. The first one is preponderant in heat-rays and the second one in light-rays. According to modern physics, "heat is a form of energy and may be measured in energy units."³ It may correspond to ātapa of Jaina Metaphysics, but ātapa denotes both heat and warm light.

From earlier recorded times up through the period of Newton's and Huygen's great discoveries, i. e. to about 1700, practically all thinking about the physical world was confined to the fields of mechanics and light. Prior to 1678, when Huygens studied the possibilities of a wave theory, it was commonly believed that light consists of corpuscles shooting out in straight lines from a luminous source. The ancient Greek philosophers knew such facts as the regular reflections of light at a smooth surface where the angle of reflection equals the angle of incidence; they knew qualitatively about the refraction of light at a surface separating two transparent media, such as air and water, and the apparent straight-line, or rectilinear propagation of light. All these facts could be explained quite well by a corpuscular theory³ of Newton that light travels in a straight line. The value of the Jaina theory of ātapa and udyota lies in the fact that it touches upon both heat and light theories in a nascent form.

MODIFICATION OF MATTER

Dravya (Substance) is one entity, while Dravya-Paryāya (modification of substance) is of two kinds, viz. jīvadravya-paryāya (modification of living substance) and ajīvadravya-paryāya (modification of non-living substance). There exist

1. Ta je ṇaṃ puggalā sūriyassa lessaṃ phusaṃti te ṇaṃ puggalā sūriyassa lessaṃ paḍinaṃti, Sūryaprajñapti, 3.26
2. Physics, p. 248.
3. Ibid., p. 588.

guṇa (quality) and paryāya (mode or modification) in Dravya (Substance); the Jaina paryāya belonging to both Dravya (substance) and guṇa compares well with the Prakṛti-pariṇāma (transformation or modification of the Primordial Matter) of the Sāṃkhya philosophy, though there is some difference of views between them.

According to Jaina Philosophy, there is paryāya of Jīvadra-
vyas and ajīvadra-
vyas (living and non-living substance), while the Sāṃkhya maintains that there takes place the transformation of Acetana Prakṛti (Non-Sentient Principle). The difference between Cetana and Acetana, i. e. jīvadra-
vyas and ajīva-
dra-
vyas is marked by sentiency and non-sentiency respectively as existing in them. In Jaina metaphysics pariṇāmavāda (the theory of evolution or transformation) also is advocated; dravya-
pariṇāma (transformation of substance) and guṇapariṇāma (transformation of quality) occur as a result of natural conditions (vaisrasika) or due to the applied or mechanical process (prāyogika). Hence paryāya is again of two kinds, viz. dravya-
paryāya (modification of substance) and guṇaparyāya (modification of quality). Both dravyaparyāya and guṇaparyāya take place in Matter. There is manifested the combined modification of Soul and Matter in the body of a being. The figure (or structure) of a being is formed by the union of Soul and body. When karmaraja (karmic-dust or karmic particle) is united with leśya-
pariṇāma (transformation of psychic condition) of Soul, there takes place avagāhanā (immersion) as a result of the combination of body and Soul. There falls an impression from Matter on Soul. When karmic matter comes into contact with soul, there occurs ajīvapariṇāma (transformation of non-living substances). Jīvaparyāya (modification of Soul) cannot happen without its gatipariṇāma (change of birth). The Buddhist kṣaṇa (moment) corresponds to the Jaina paryāya for kṣaṇas (moments) like rūpa (colour), rasa (taste), gandha (smell), etc., of the Buddhist philosophy are equivalent to paryāyas of Jaina metaphysics. Tadetrūpa-kṣaṇam of the Buddhists, Tanmātras of the Sāṃkhya and Viśeṣa (particularity) of the Yoga reflect the Jaina

Paryāyavāda. It was the question to Vasubandhu whether the present dravya-paryāya was, is and will be respectively in the past, at present and in future.¹ Bergson maintains that "the truth is that we change without ceasing, and that the state itself is nothing but change".

The Jaina Paryāyavāda is again of two kinds, pūrvaparyāya (prior or past modification or mode) and paraparyāya (posterior or future modification or mode). It appears that paryāya-paramparā (tradition of mode) has been changing in the Indian Philosophy, for the Jainas accept two kinds of paryāya, viz. paryāya-sadrśa (similar or general modification) and paryāya-visadrśa (dissimilar or particular modification), while the Buddhists maintain paryāya-visadrśa (dissimilar or particular modification) in santānas (issues or series) or flux of the Sautrāntikas. The Sāṃkhya admits sadrśa pariṇāma (similar or general transformation) in the Guṇa-series and visadrśa-pariṇāma (dissimilar or particular transformation) in its creative evolution.

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1. There are dravyappravāha and paryāyappravāha on the screen of time (kāla paṭa)

The Buddhists advocate paryāyappravāha (series of modes or issues) in the form of rūpakṣaṇa, etc. According to the Sāṃkhya there takes place guṇaparyāya (pariṇāma) and dravyaparyāya (pariṇāma) in Prakṛti. There emerges Buddhi (intellect), Ahaṃkāra (ego), manas (mind) etc. from the modification of Prakṛti out of guṇas-sattva, etc.

The emergence of tanmātra (infra-atomic potential) from Bhūtādi (original mass), paramāṇu (atom), gross elements of Matter is Dravyaparyāya. In Yogasūtra Prakṛti is accepted as sāmānya (general), while tanmātra, etc. are admitted as viśeṣa (particular), for there emerges ākāśa (ether), etc. from tanmātra (infra-atomic potential). In the Sāṃkhya-yoga Prakṛti is conceived as one unmanifest or intangible substance, while the intangible infinite atoms are conceived in Jaina Philosophy as nānāprakṛtis (many prakṛtis).

AJĪVAPARYĀYA (MODIFICATION OF NON-LIVING SUBSTANCE)

As the topic is conceived here with the modification of Matter, the study of it will be confined to an analysis of ajīva-paryāya (modification of non-living substance) by leaving out the treatment of jīvaparyāya (modification of living substance). Ajīvaparyāya is of two kinds, viz. rūpī-ajīva-paryāya (modification of corporeal material non-living substance) and arūpī-ajīva-paryāya (modification of non-corporeal non-living substance.)¹ Arūpī-ajīva-paryāya is stated to be of ten kinds² viz. Dharmāstikāya (Principle of Motion), Dharmāstikāyadeśa, (part of Dharmāstikāya), Dharmāstikāyapradeśa (smallest unit of Dharmāstikāya), Adharmāstikāya, (Principle of Rest)-Adharmāstikāyadeśa (part of Adharmāstikāya). Adharmāstikāyapradeśa (smallest unit of Adharmāstikāya), Ākāśāstikāya (Space), Ākāśāstikāyadeśa (part of Space) and Ākāśāstikāyapradeśa (point of space) and Addhāsamaya (Time).³ There are stated to be four kinds of rūpī-ajīva-paryāya, viz. skandhas (molecules or aggregates), skandhadeśa (part of molecule or aggregate), skandhapradeśa (smallest unit of aggregate)⁴ and paramāṇus (ultimate atoms).⁵

Ultimate atoms and their aggregates are infinite in number.⁶ There are infinite modifications of ultimate atoms, for one ultimate atom is equal to another one from the points of view

1. Duvihā ajīvapajjavā, taṃjahā—rūvī ajīvapajjavā ya arūvī-ajīva-pajjavā ya—Paṇṇavanā, 266.
2. Ibid. 267.
3. Paṇṇavanā, 267 (Suttagama)
4. Skandha, skandhadeśa and skandhapradeśa form one joint family in which ultimate atom also is united, though it is a unit (pradeśa), i. e. pradeśa is conceived by intellect, while paramāṇu (ultimate atom) is separate or discrete from that family.
5. When an ultimate atom exists separately.
6. Paṇṇavanā, 288.

of substance, mode and immersion, but it may be less or equal or more from the point of view of duration (sthiti). If it is less, it is less by innumerableth part (pradeśa) or numberableth part or numberablefold or innumerablefold. If more, it is more by innumerableth part or numberableth part or numberablefold or innumerablefold.¹

With regard to the modification of black colour, it (ultimate atom) is sometimes less, sometimes equal and sometimes more. If less, it is less by infiniteth part (unit) or innumerableth part or numberableth part or numberablefold or innumerablefold or infinitefold. In the case of modifications of the remaining colours, smell, taste and touch six sections of the above account of an ultimate atom should be known.² Of the eight touches there are stated to be six sections of the said account of an ultimate atom with regard to the four touches, cold-warm, and cohesive-dry. For this reason, it is said that there are infinite modifications of ultimate atoms.

There are stated to be infinite modifications of the dvipradeśika skandha (dyad), for one dvipradeśika skandha is equal to another dvipradeśika skandha from the substantial and modal stand-points, but it is sometimes less, sometimes equal and sometimes more with regard to immersion (avagāhanā). If less, it is less by one unit (pradeśa); if more, it is more by one unit (paesa-sama-bbhahie). In regard to duration (sthiti) there are stated to be four sections as mentioned above in the case of ultimate atom, while six sections of the account of dvipradeśika skandha should be known with regard to colours, etc. and the aforesaid four kinds of touch. In this way a detailed account of the modifications of paramāṇus (ultimate atoms), dvipradeśikaskandhas up to anantapradeśika-skandhas have been given in the Prajñāpanā Sūtra from the points of view of substance, mode, immersion, duration, colour,.

1. Paṇṇavanā, 288.

2. Evaṃ avasesavaṇṇagāṇḍharasaphāsapajjavehiṃ chaṭṭhāṇavaḍḍie, PV., 268.

smell, taste and touch,¹ having kept in view minimum, maximum and neither minimum nor maximum (medium) numbers of them in the light of substance and quality.²

Besides, there are stated to be infinite modifications of Jaghanya guṇakālaka-paramāṇu (ultimate atom having the lowest degree of the quality of blackness). A paramāṇu having such quality is equal to another jaghanyaguṇakālakaparamāṇu from the points of view of substance, mode, immersion and four sections with regard to duration; it is equal to the latter with regard to the modes of black colour; six sections should be known in the case of smell, taste, and two touches. Thus the accounts of the utkrṣtaguṇakālakaparamāṇu (ultimate atom having the highest degree of quality of blackness) and ajaghanya-anutkrṣtaguṇakālaka-paramāṇu (ultimate atom having neither the lowest nor the highest degree of quality of blackness) should be understood; only the difference is that in their respective categories six sections should be known. In this way infinite modes of jaghanyaguṇakālaka dvipradeśikaskandha (molecule having two units of matter) upto ananta-pradeśikaskandhas (molecules having infinite units of matter) are explained from various points of view in the case of the remaining colours, taste, smell and touch.

The accounts of these modifications of Matter from the stand-points of substance, mode, immersion, duration and properties—colour, taste, smell and touch, appear to be thought—provoking when compared to the modes or relations of Matter as dealt with in the physical sciences. In both physics and chemistry Matter has been conceived to the infinite in number from the aspects of substances, quality and relations (or modes).

1. See PV., 269-274.

2. Ibid., 275-279.

CLASSIFICATION OF MATTER

In Jaina Philosophy Matter is classified into one, two, three, four, six, twenty-three, five hundred thirty and infinite groups from the points of view of (1) dravya (substance), kṣetra, (field), kāla (time) and bhāva (condition), (2) atomic and molecular forms of existence, (3) apprehensibility and inapprehensibility, receivability and non-receivability, etc., (4) transformation, (5) parts of molecule, (6) grossness and fineness of matter, (7) vargaṇā (the group having the same numerical value), (8) prominence of particular quality of matter, (9) jāti (category), part of quality (guṇāmśa) and mode or modification of matter, respectively.

Matter is infinite in number from the point of view of dravya (substance).¹ All material substances—sapradeśa and apradeśa (having parts and partless) are infinite with regard to dravya, kṣetra, kāla and bhāva.² The classification of infinite forms of matter is also made from this substantial point of view.³ These infinite forms of matter are of infinite kinds with regard to jāti (category)⁴ and bhāva (condition).⁵ Molecules and ultimate atoms are stated to be of infinite kinds from

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1. Davvao naṃ poggalatthikāe aṇaṃtāim davvāim., Bhs., 2. 10. 117.
 2. Davvādesenavi me ajjo savve poggalā sapaesā vi appaesā vi aṇaṃtā, khettādesenavi evaṃ ceva, kālādesenavi, bhāvādesenavi evaṃ ceva, Ibid., 5. 8. 220.
 3. Anantā bhedāpi pudgalāḥ, RV., V. 25. 3.
 4. Jātyādhārānantabhedasaṃsūcanārthaṃ bahuvacanaṃ, aṇavaḥ skandhāśca kriyate,, RV., V. 25.
 5. Paramāṇapoggalā .no saṃkhejja no asaṃkhejjā aṇaṃtā, evaṃ jāva aṇaṃtapaesiyā khaṃdhā .jāva aṇaṃtaguṇalukkhāttī, Bhs., 25. 4. 740.

the modal stand-point, because the modes of matter are infinite.¹

One class of Matter

All forms of matter are individually ultimate atoms, i. e. the finest forms of matter. Matters or forms of matter existing in uncombined or discrete state are ultimate atoms,² hence there is one class of Matter, i. e. paramāṇu (ultimate atom), with regard to the nature of ultimate atom. The ultimate division of Matter is only one ultimate atom. All forms of matter are ultimate atoms from the point of view of Niścaya Naya (real point of view). Therefore, an ultimate atom is one from the general stand-point³ and the class of ultimate atoms is one.⁴ It is stated that there is one—one class of Matter with regard to dravya, kṣetra, kāla and bhāva, viz. one class of ultimate atoms upto one class of molecules having infinite units (pradeśas) one class of matters immersed in countless space—points, one class of matters having the duration of one samaya (instant) upto one class of matters having the duration of countless samayas (instants) and one class of matters having onefold black colour upto one class of matters having innumerablefold black colour and one class of matters having infinitesfold black colour, thus with regard to the remaining colours, smells, tastes and

1. Khamdhā khamdhadesā, khamdhapaesā paramāṇupoggalā, cauvvihā ajIvapajjavā no saṁkhejjā, no asaṁkhejjā aṇantā, PV., 5. 268; see also BhS., 25. 5. 740;

Aṇantā paramāṇupoggalā, aṇantā dupaesiyā khamdhā jāva aṇantā dasapaesiyā khamdhā, aṇantā saṁkhejjapaesiyā khamdhā, aṇantā asaṁkhejjapaesiyā khamdhā, aṇantā, aṇantapaesiyā khamdhā, PV., 5. 268

2. Parasprenāsamyuktā paramāṇavaḥ TS., Bhā Ṭī, V. 25, p. 366 2;

Tatrāṇavo abhandhāḥ skandhāstu baddhā eveti, TS., p. 366.

3. Ege paramāṇu, Sthānā., 1, 45.

4. Egā paramāṇupoggalāṇaṁ vaggāṇā, Ibid., 1.57.

touches upto one class of matters having infinitesimal dry touch, one class of molecules (skandhas) having minimum number of units, one class of molecules having maximum number of units, one class of molecules having neither minimum nor maximum number of units, thus the classes of molecules having minimum, maximum and neither minimum nor maximum immersion, minimum, maximum and neither minimum nor maximum duration, minimum black colour, maximum black colour and neither minimum nor maximum black colour; thus with regard to the remaining colours, smells, taste and touches upto one class of molecules having neither minimum nor maximum dry touch.¹

In the Nyāya-Vaiśeṣika Philosophy, paramāṇus (ultimate atoms) from one class as the ultimate cause of the Universe, though there are stated to be different kinds of paramāṇus e. g. earth-atom, etc. According to the Sāṃkhya-Yoga, Prakṛti represents one class of matters as the Primordial Matter like the Jaina Paramāṇus, while in the physical sciences only energy of matter exists as one class in the form of its manifestation in the Universe.

Two classes of Matter

In Jaina Philosophy the entire mass of Matter (Pudgala) has been classified into two forms, viz. paramāṇu (ultimate atom) and skandha (molecule or aggregate of ultimate atoms). So Matter exists in the forms of paramāṇu and skandha (ultimate atom and molecule). The material substance which is cause-like is called paramāṇupudgala (ultimate material substance); it is eternal. The apprehension of this atomic matter cannot be made by the senses; it is the material substance which is to be apprehended by the knowledge revealed in the Āgama or by inference. The existence of it has been inferred by the mark of its effect. Those material effects which are come across are

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1. Egā paramāṇupoggalāṇaṃ vaggaṇā ajahannukkosagūṇalukkhāṇaṃ poggalāṇaṃ vaggaṇā—Sthānā, I. 74, p. 185.

having a cause. In this way that which will be intangible last effect should also have the cause, i. e. it is paramāṇudravya (atomic substance); it is called an ultimate cause because of there being no other material substance as its cause. There is neither further division of an ultimate atom nor can there take place any division of it. For this reason it is its own beginning, its own middle and its own end in itself. Atomic material substance is infinite and discrete (unaggregated) in its own condition. So there are stated to be two kinds of ultimate atom, viz. kāraṇa-paramāṇu (cause-ultimate atom) and kārya-paramāṇu (effect-ultimate atom).¹

Akalāṅka deals with the extreme point of view of the Vaiśeṣikas with regard to the mark (liṅga) of paramāṇu in the following manner: "The last atom is only cause, subtle and eternal. There is one taste, one smell, one colour and two unopposing touches in it and it is inferable by the mark of its effect."² But it is not logical. The argument "paramāṇu is only cause" is not proper because it is also an effect on account of its production by the division of skandhas (molecules). Its kāryatva (effectness) is negatived by the statement "kāraṇameva". When "kāraṇamapi" is stated, then kāryatva remains unnegatived. In an ultimate atom the qualities like cohesiveness, etc., are born and destroyed. Therefore, it cannot be called permanent by all means because of being somehow non-permanent (non-eternal). "The ultimate atom exists as aṇu (small) from the beginningless time, and it is the cause of binary compound, etc., from this point of view it is called "kāraṇameva". This solution of the said problem is not correct, for, if the ultimate atom does not give up its aṇutva (atomicity or smallness), there does not take place any production of effect. If there is the division of aṇutva (atomicity) then

1. Dhātucatuṣkasya punaḥ yo hetuḥ kāraṇamiti saṃjñeyah
Skandhānāmavasāno jñātavyaḥ kārya-paramāṇuḥ,
Niyamasāra, 25 (Skt. Chāyā).

2. VS., 4. 1. 2.

it itself will be an effect. It cannot be called cause (kāraṇa) also till an effect is produced by the division of such anutva (atomicity). In the absence (or non-existence) of the son, the father is not appellated as such. There cannot fall the shadow, etc., of the beginningless ultimate atom, for shadow, etc., take place in the case of skandha. Therefore an ultimate atom cannot be the cause from the point of view of an effect like shadow, etc. They are perceptible to the eyes. Hence they cannot be the effects of ultimate atoms. An effect of ultimate atoms will be imperceptible to the sense of sight: nevertheless, there is no anu (atom) existing in the condition of paramāṇu (discrete ultimate atom) since the beginningless time upto the present time. In the Sūtra "Bhedādanuḥ" the origination of paramāṇu by the process of division of skandha has been stated. Therefore, from the point of view of beginningless ultimate atom (anādi paramāṇu), it is not proper to call it permanent or eternal, for there takes place in it also a transformation of the qualities like cohesiveness, etc., at every moment. No object is devoid of change. Like the binary compound, etc., an ultimate atom is never produced. Hence it is only cause from the stand-point of substance; decay and origination do not occur in it, so it is permanent (nitya). Like this, here is no contradiction of 'evakāra' even¹ in particular alternative 'kāraṇameva.'

An ultimate atom is partless; therefore, there are one taste, one smell and one colour in it. There can be many tastes in sāvayava lemon, etc., and many smells in anulepana, etc. In

1. Kāraṇameva tadantyaṃityasamīkṣitābhīdhānaṃ; katha-
ñcit kāryatvāt, RV., 5. 25. 5, p. 491;
Avirodha iti cet, na; eva śabdenāvadhāraṇāt,
Ibid., 5.25.6, p. 491;
Nitya iti cāyuktaṃ snehādibhāvenāntīyatvāt,
Ibid., 5.25.7, p. 491;
Anādi paramāṇvavasthamiti cet, na; tatkāryābhāvāt,
Ibid., 5.25.8, p. 492.

ultimate atoms there are two unopposing touches—any one between cold and warm touches and any one between cohesive and arid touches; the qualities—heaviness, lightness, softness and hardness are not found in an ultimate atom, for they belong to skandha (molecule). The existence of ultimate atoms is proved by the effect-like molecules, e. g. body, sense-organs, elements, etc. It is an agreed principle that the inference of cause is drawn by the mark of effect (kārya-liṅga). In the absence of ultimate atoms the molecules-effects cannot be possible.¹ Therefore, that mark can be justified from the point of view of manifoldedness only. An ultimate atom is syāt-kāraṇa (some-how cause) because of being a producer of effect-like molecules, such as, binary compounds, etc. It is produced by the process of division of the molecules and is thus syāt-kārya (somehow effect) because of being a substratum of the qualities belonging to the effect. There is no smaller division than this ultimate atom; therefore, it is syāt antya (somehow last); it is also not antya (last) because of the division of its qualities, though there is no division of a unit (pradeśabheda). Hence there being fine transformation, it is syāt sūkṣma (somehow fine) and it is also gross (sthūla) because of having the capacity of producing a gross effect. It does not give up substantiality, so it is permanent; it is non-permanent because of its attaining skandhaparyāya (molecule-like mode) and undergoing transformation of its qualities. In the alternative of “apradeśatva” (partlessness) it is endowed with one taste, one smell, one colour and two touches; it is also possessed of many tastes, etc., because of there being the capacity of transformation in it to be anekapradeśī skandharūpa-pariṇāma (transformation as molecules having many units). On account of its being inferable by a mark of an effect it is syāt kāryaliṅga (somehow a

1. Ekarasavarṇagaṁdha aṇuḥ niravayavatvāt,

RV. 5. 25.13, p. 492;

Dvisparśo virodhābhāvāt, Ibid., V. 25.14, p. 492;

Tadastitvaṁ kāryaliṅgatvāt, Ibid., 15, p. 492.

mark of effect) and it is also not *kāryaliṅga* because of being an object of perceptual knowledge.¹

There are stated to be two kinds of *paramāṇu*,² viz. *sūkṣma* and *vyavahārika* (fine and empirical) from the noumenal and phenomenal points of view respectively. One *vyavahārika* *āṇu* is constituted of infinite *sūkṣma* *āṇus*. It is determined from the aspect of phenomenality (*vyavahāra*).³ Here it is suggestive that a *vyavahārika* *āṇu* may correspond to an atom of the physical sciences, which is divisible, while a *sūkṣma* *āṇu* may correspond to electron, proton, neutron, etc. That is to say, this view of modern science that what was comprehended as atom is further splittable into its component parts which are called proton, neutron, electron, etc.

Skandha (Molecule or Aggregate)

An aggregate which ultimate atoms from by combining with one another is called *Skandha*.⁴ So the second form of *Pudgaladravya* (material substance) is *skandha* (molecule or aggregate). All *skandhas* are formed as aggregate. A *skandha* is an effect-substance-like (*kārya-dravya-rūpa*) with regard to its own cause—substance (*kāraṇadravya*) and it is also a cause-substance-like with regard to its own effect-substance (*kārya-dravya*) e. g. *skandhas* having two units (*pradeśas*): they are the effects of *paramāṇus* (ultimate atoms) etc., and also the cause of *skandhas* having three units (*pradeśas*) of matter. Therefore, a *skandha* is an aggregate of *paramāṇus* (ultimate

1. *Anekāntaḥ kāraṇatvādivikalpaḥ*, RV., 5.25.16

2. *Anuyogadvāra* of *Maladhārī* Hemacandra, Sū., 133, and *Jambudvīpaprājñapti*, 19, Gā., 100, p. 169;

Dvidvidhaḥ paramāṇuḥ syāt sūkṣmaśca vyavahārikaḥ
Anantairāṇubhiḥ sūkṣmaireko' āṇurvyavahārikaḥ,
Lokaprakāśa, 1.21.

3. *Lokaprakāśa*, 1.21.

4. *Skandhāstu baddhā eveti'parasparasamhatyā vyavasthitāḥ*,
TS., Bhā., *Ṭīkā*, V. 25, p. 366;

Pariprāptabandhapariṇāmāḥ skandhāḥ, RV., V. 25. 16.

atoms).¹ Skandhas possess a gross and undergo the process of integration and disintegration.² "Skandhas are the aggregates of ultimate atoms which in their gross state can be taken by the hand and handled."³ "If action is present in a few instances by synecdoche it can be extended to others in conventional acceptation. Hence the word 'skandha' is applicable also to molecules consisting of two or more atoms, which cannot be handed, etc."⁴ Though Matter is of infinite varieties, still it is classified into two groups on the basis of ultimate atoms and molecules."⁵

Śrī Vinayavijaya⁶ maintains that a skandha is formed by infinite finest ultimate atoms from the noumenal points of view (Niścayanaya). Skandhas are characterized by sound, combination; fineness, grossness, shape, division, darkness, shadow, heat (sunshine, etc.) light (moonlight, etc.) as well as by touch, taste, smell and colour.⁷ They are of two kinds, viz. bādara (gross—those that can be perceived by the senses)

1. Khamdho paramāṇusaṅgo saṁghādo, PS. 79, p. 62, (Rāyacandra Jaina Śāstramālāyām)
2. Sthūlabhāvena grahaṇanikṣepaṇādivyāpāraskandhanāt-skandhā iti saṁjñāyante, etc., SS., p. 291.
3. Reality, p. 153.
4. Ibid.
5. Rudhau kriyā kvacitsati upalakṣaṇatvenāśriyate iti grahaṇādivyāpārayogyeṣvapi dvyāṇukādiṣu skandhākhyā pravartate, anantabhedā'api pudgalā aṇujātyā skandhajātyā ca dvaividhyamāpadyamānāḥ sarve grhyanta iti, SS., V. 25 (comm), p. 297.
6. Vyavahāranayenaiva paramāṇurayaṁ bhavet Skandho anantāṇuko jātasūkṣmatvo niścayātpunaḥ, Lokaprakāśa; Śl., I. 23.
7. Skandhāḥ punaḥ śabdabandhasaukṣmyasthaulyasaṁsthānabhedatamaśchāyātapodyotavantaśca sparśādīmantaścetī SS., V. 25 (Comm), p. 297.

and *sūkṣma* (fine—those which are intangible to the senses).¹ Although the capacity of combining with each other is absent in the combination composed of only two elementary particles, they are still called *skandhas*. *Skandhas* are stated to be of three kinds from the stand-point of parts, viz. *skandha*, *skandhadeśa* and *skandhapradeśa*. The particular aggregate of infinitesimal infinite ultimate atoms is a *skandha* (molecule), half of it is *skandhadeśa* and half of that half is *skandhapradeśa*.² That is, the smallest piece of matter possessing all the characteristic properties of a material substance is the complete *skandha* (molecule). According to the *Nyāya-Vaiśeṣika* Philosophy, there are stated to be two forms of Matter, viz. *avayava* (constituent) part, i. e. *paramāṇu* and *avayavin* (composite whole). *Avayava-paramāṇu* stands for *Jaina paramāṇu* and *avayavins*, such as, *dvyāṇuka*, etc., represent *skandhas* of the *Jaina* system of thought respectively. The relation between an *avayava* and an *avayavin* is that they exist as cause and effect. As an effect the latter inheres in the former which represents the cause. They are related by inherence, still they are the two distinct entities possessing different attributes and functions.³ In regard to this classification of Matter into two groups the basic difference between *Jaina Metaphysics* and the *Nyāya-Vaiśeṣika* is this that the latter accept *paramāṇu* (ultimate atom) as the ultimate cause, while the former admits it as both cause and effect. So according to the *Nyāya-Vaiśeṣika*, *paramāṇus* are the cause of the material Universe and *dvyāṇuka* (dyad) *tryāṇuka* (triad), etc., are the effects.

The classification of Matter into two groups, viz. *paramāṇu*

1. PS., 82;

Pārthivadravyāṇām gandhaḥ tadguṇa ivopalabhyata iti cet; na sādhyatvāt, RV., p. 493.

2. *Anantānantaparamāṇubandhaviśeṣaḥ skandhaḥ, tadardham deśaḥ, ardhārdham pradeśaḥ*, RV., p. 493;
see also GS., Jīva, 604.

3. NS., 2. 1. 32-36.

and skandha, is also come across in the Buddhist philosophy in different manner. The Buddhist kalāpa or Saṃghātaparamāṇu represents the Jaina paramāṇu. According to the Buddhists, paramāṇus exist always in combination, but not in discrete state. Rāśī is called skandha,¹ whatever matters whether past or future or present, internal or external, gross or fine, less or more (minimum or maximum) distant or near—all these taken together are called rūpaskandha.² The difference between the Jaina and Buddhist views on these two forms of Matter is this that the Buddhist paramāṇa is saṃghāta-paramāṇu consisting of seven or eight or nine or ten material particles; it is not the cause-like paramāṇu of Jaina Metaphysics. The Saṃghāta-paramāṇu of the Buddhists actually corresponds to vyavahārika paramāṇus of the Jainas. According to the physical sciences also, there are mainly two forms of Matter, viz. atom and molecule, although atom is subject to further division into electron, proton, neutron, etc.

Two classes of Matter from the Point of view of Apprehensibility

In Jaina Philosophy Matter has also been classified into two groups from the point of view of apprehensibility by the senses, its tactile quality and its unitariness (pradeśātmakatā), viz. sūkṣma and bādara (fine and gross).³ Matters which are

1. Rāśyāyadvārāgotrārthāḥ skandhāyatanadhātavaḥ
Mohendriyaruṣitraidhāt tisraḥ skandhādiddeśanāḥ,
Abh. K., 1. Kā 20; see Vibhāṣā, 74, p. 383.
2. See Saṃyuktanikāya, 25. 2;
Yatkiñcid-rūpamatItānāgatapratyutpannam ādhyātmikam
vā bāhyam vā audārikam vā sūkṣmam vā hīnam vā
praṇītam vā dūram vā antikam vā tadekadhyamabhisam-
kṣiptyāyamucyate rūpaskandhaḥ,
Vibhaṅga, p. 1, Vide Abhidharmakośa (Hindi), p. 31.
3. BhS., 8. 1. 310 ff:
Duvihā poggalā paṇṇattā, tamjabā-suhumā ceva bāyarā
ceva, Sthānāṃga, 82;
Suhumā savvalogammi, logadese ya bāyarā, Uttā., 36. 12.

intangible to the senses are called fine pieces of Matter. All ultimate atoms are fine and intangible to the senses. Among molecules also, the constitution (or a structure) of many of them are such that they cannot be apprehended by the senses, e. g. dyad (dvyaṇuka), triad (tryaṇuka), karmic matter; they are also called fine.¹ Skandhas (molecules) which are tangible to the senses are called gross matter,² e. g. clarified butter, water, oil, etc. That is to say, fine matter is that which is an object for thought-activities and is beyond the sense-perception and gross matter is that which is within the range of sense-perception. As to the second point of view—the tactic quality, it is explained that dvīsparśin pudgala (matter having two touches), trīsparśin (matter having three touches), catursparśin (matter having four touches) and finely transformed matter having eight touches are fine. The remaining molecules having eight touches are gross.³ In regard to the third point that Matter is fine and gross from the point of view of pradeśāt-makatā (unitariness or discreteness), it is explained that apradeśin pudgala (partless matter) or ekapradeśin-pudgala (Matter having one unit), dvīpradeśin pudgala (molecule having two units), daśapradeśika (molecule having ten units), saṁkhyātapradeśika (molecules having countable units), asaṁkhyātapradeśika (molecules having countless units), and sūkṣma pariṇata-anantapradeśika skandha (fine-transformed molecule having infinite units) are called fine.⁴ Gross transformed molecules having infinite units (bādarapariṇata-anantapradeśika skandha) are called gross.⁵ The classification of Matter into

1. Sūkṣmā bhavanti skandha-prāyogyāḥ karmavargaṇāsya punaḥ, Niyamasāra, 24 (Skt. Chāyā)
2. Sthūlā iti vijñeyā sarpiṇjalatāilādyāḥ. Ibid., 22 (Skt. Chāyā).
3. Ye punaratIndriyadvyaṇukādavo anantāṇukaparyavasānāḥ skandhāḥ sūkṣmāste, TS., Tī, p. 373;
Ta eva bādarāsta eva ca punaḥ sūkṣmā iti, Ibid.
4. TS. Tī, p. 373.
5. Ibid.

fine and gross can also be made from the point of view of field (kṣetra) and immersion (avagāhanā). The account for these two kinds of Matter is one and the same from the four points of view.

According to the Nyāya-Vaiśeṣika also, Matter has been classified into two groups, viz. *anu* (small) and *mahat* (great), while the Buddhist philosophy classifies it into two divisions, viz. *sūkṣma* (fine) and *sthūla* (gross), just as it is found in Jaina metaphysics. There are stated to be two classes of Matter from the aspect of its capacity to be received and not to be received by Soul, viz. *grāhya* (receivable) and *agrāhya* (non-receivable).¹ Matter is received by soul and it can be transformed but it is not receivable to Soul in all conditions. An ultimate atom is not receivable to it. Molecules having two and four touches are non-receivable to it. Only some kinds of molecules having eight touches are capable to be received by it. Therefore, Matter is classified into two groups, viz. *grāhya* (receivable) and *agrāhya* (non-receivable) from the point of view of its capacity to be received and not to be received. Matter is *aviśeṣita* (non-particular, i. e. general), while *paramāṇu* (ultimate atom), *dvipradeśika skandha* (dyad) upto *anantapradeśika skandha* (molecule having infinite units) are *viśeṣita* (particular).² Besides, Matter has been classified into two groups from various points of view, such as, *bhinna* and *abhinna* (broken and unbroken), *chinna* and *achinna* (disintegrated and non-distintegrated), *paramāṇupudgala* and *na-paramāṇupudgala* (atom and molecule),³ *baddhapāsapuṭṭha* and *no-baddhapāsapuṭṭha* (deeply attached and not-deeply attached), *paryāyātīta* and *aparyāyātīta*, *attā* and *anattā* (favourable and unfavourable or received and not-received), *iṣṭa* and *aniṣṭa* (desirable and undesirable), *manojña* and *amanojña* (pleasant and unpleasant), *sacitta* and *acitta* (having

1. *Pañcama Karmagrantha*, 75; *Viśeṣāvaśyakabhāṣya*, 636-38; GS., Jīva, 593-4.

2. *Anuyogadvāra*, 123.

3. They are already discussed above.

consciousness and without consciousness), śubha and aśubha (auspicious and inauspicious), etc.¹ In this way, Matter has been classified into two groups from various points of view.

Three classes of Matter

Matter has been classified into three groups from the point of view of transformation, viz. prayogapariṇatapudgala (organic matter), miśrapariṇatapudgala (organic-cum-inorganic matter), and visrasāpariṇatapudgala (inorganic matter).² The material substances that are produced by the living organism, vegetables or animals are classified as prayogapariṇatapudgala (organic matter) and all those material substances which are not prepared from the living organism but from the inanimate objects by the natural innate disposition are classified as visrasāpariṇatapudgalas (inorganic matters) and all material substances that are the synthetic products of these two processes—vital force and natural force are classified as miśra-pariṇata-pudgalas (matters produced by the mixed processes). That is, matter transformed by the action of beings into the physical form, matter transformed by the action of beings-cum-natural innate disposition and matter transformed

1. Sthānā, 10. 107 (chinna and achinna);

BhS., 14.9.535 (attā and anattā) iṣṭa and aniṣṭa); 7. 10. 308 (acitta); 5. 9. 224 (śubha and aśubha), 14. 8. 553;

Duviḥā poggalā, pa. taṃ-bhinnā ceva abhinnā ceva 1, duviḥā poggalā pa. taṃ-bheuraḍḍhammā no-bheuraḍḍhammā ceva 2, duviḥā poggalā pa. taṃ-paramāṇupoggalā ceva no-paramāṇupoggalā ceva 2, duviḥā poggalā pa. taṃ-suhumā ceva bāyarā ceva, duviḥā poggalā paṇṇattā, taṃ-pariyāditacceva apariyāditacceva, duviḥā poggalā paṇṇattā, taṃ-attā ceva anattā ceva, duviḥā poggalā pa. taṃ-itthā ceva anitthā ceva, evaṃ kaṃtā, siya, maṇuṇṇā, maṇāmā, Sthā., 2. 82; See Anuyoga. 123.

2. Tivihā poggalā paṇṇattā, tamjahā prayogapariṇatā, missapariṇayā viśasā-pariṇayā, BhS., 8.1.309; see Sthānāṅga, 3. 186.

by the natural process form the three classes of Matter from the point of view of transformation. Matters which have been transformed by beings on receiving them are called prayoga-pariṇata (organic matter) and matter which have been transformed by the action of beings, but now being given up by the action of them, (they) are themselves undergoing transformation by the natural process, are stated to be miśrapariṇata-pudgala. That is, matter in which there takes place simultaneously a transformation by the action of the being and by the innate nature is called miśrapariṇatapudgala. Matter in which there occurs a transformation by its own innate nature or in the transformation of which there is no help of any being, is called visrasāpariṇatapudgala (inorganic matter).

These three classes of Matter have been divided into many sub-classes from various points of view. For example, there are stated to be five kinds of prayoga-pariṇatapudgala, viz. ekendriya-prayogapariṇata-, dvīndriya-prayoga-pariṇata-, trīndriya-prayoga-pariṇata-, caturindriya-prayoga-pariṇata- and pañcendriya-prayoga-pariṇata-pudgalas. Ekendriya-prayoga-pariṇata-pudgalas are of five kinds, viz. pṛthivīkāyikaprayoga-pariṇata-pudgala, ap-kāyika-prayoga-pariṇata-pudgala, taijasa-kāyika-prayoga-pariṇata-pudgala, vāyukāyika-prayoga-pariṇatapudgala, and vanaspatikāyika-prayoga-pariṇata-pudgala. That is to say, matters transformed by the actions of one-sensed earth-bodied, water-bodied, fire-bodied-, air-bodied- and plant-bodied-beings respectively. They are again sub-divided into two main groups, viz. sūkṣma (fine) and bādara (gross) so on. Miśra-pariṇata-pudgala are of five kinds, viz. ekendriya miśra-pariṇata-pudgala up to pañcendriya-miśra-pariṇata-pudgala. They are again subdivided into many kinds up to āyata-saṁsthāna-pariṇata-pudgalas.¹

Visrasā-pariṇata-pudgala is of five kinds, viz. varṇapariṇata, gandhapariṇata, rasapariṇata, sparśapariṇata and saṁsthānapariṇata. They are again sub-divided into many groups

1. BhS., 8. 1. 311.

according to their respective numbers, e. g. varṇapariṇāta-pudgala is of five kinds, viz. kālavarṇa-pariṇāta up to śukla-varṇapariṇāta, and so on.¹

The Jaina view on these three classes of Matter is well supported in the organic chemistry.² It is explained there that all those which could be obtained from vegetables or animals, i. e., substances that were produced by the living organism, were classified as organic; and all those substances which were not prepared from the living organism were classified as inorganic.

At this stage of investigation of organic compounds it appeared that there were the definite differences between organic and inorganic compounds, e. g. complexity of composition and combustibility of the former. Berzelius (1951) thought that organic compounds were produced from their elements by laws different from those governing the formation of inorganic compounds. This then led him to believe that organic compounds were produced under the influence of a vital force, and that they could not be prepared artificially.

"In 1828, Wohler converted ammonium cyanate urea, a substance hitherto obtained only from animal sources. This synthesis weakened the distinction between organic and inorganic compounds, and this distinction was completely ended with the synthesis of acetic acid from its elements by Kolbe in 1945, and the synthesis of methane by Berthelot in 1956. A common belief appears to be that Wohler's synthesis had little effect on the vital force theory because it did not start with elements. Wohler had prepared his ammonium cyanate from ammonia and cyanic acid, both of which were of animal origin. Partington (1960), however, has pointed out that Priestley (1781) had obtained ammonia by reduction of nitric acid, which was later synthesised from its elements by Cavendish (1785). Also, potassium cyanide was obtained by Scheele

1. BhS. 8. 1. 312.

2. Organic Chemistry, Vol. I. I., L. Finar, Ch. I., pp. 1-2.

(1783) by passing nitrogen over a strongly heated mixture of potassium carbonate and carbon, and since one form of carbon used graphite, this reaction was, therefore, carried out with inorganic materials. Since potassium cyanide is readily converted into potassium cyanate, Wohler's synthesis is one which starts from the elements. Since the supposed differences between the two classes of compounds have been disproved, the terms organic and inorganic would appear to be no longer necessary. Nevertheless, they have been retained, but it should be appreciated that they have lost their original meaning."¹

Four classes of Matter

Matter is also classified into four groups from the point of view of parts of skandha (molecule), viz. skandha (molecule) skandhadeśa (part of aggregate), skandhapradeśa (unit of aggregate) and paramāṇu (ultimate discrete atom)¹. As pointed out, there are two main forms of Matter, viz. paramāṇu and skandha (molecule). Here the four classes of matter have been described by making three divisions of skandha into (1) skandha (aggregate), skandhadeśa (part of aggregate) and skandhapradeśa (unit of aggregate) respectively and by adding paramāṇu into this classification. The aggregate of combined ultimate atoms is called skandha. The part of skandha which again can be divided is called skandhadeśa. There the division of skandhas having two upto infinite constituent elements is stated to be deśa. Whatever paramāṇus having been combined, are formed into a skandha, (that much) are the pradeśas (units) of it, i. e. the units of the undivided skandha having the extent of an ultimate atom (paramāṇu), even when combined in a skandha, is known to be pradeśa. The indivisible

1. Organic Chemistry, Vol. 1, pp. 1. 2.

2. Je rūvīte cauvvihā paṇṇattā, taṃjahā khaṃdhā, khaṃdhadesā, khaṃdhapaesā, paramāṇupoggalā, BhS., 2.10. 119 ;
see Jivābhigama, 5.

Uttarā, 30.10; Anuyogadvāra. 142.

matter in its discrete state is called paramāṇu. They are thus described from the point of view of gross state for the aggregate of combined ultimate atoms, which is full in all parts, is stated to be a skandha, the half of it is called deśa and the half of that half is pradeśa and the indivisible unit is paramāṇu.¹ The Jaina deśa and pradeśa of a skandha correspond to avayavin and avayava of the Nyāya-Vaiśeṣika respectively.

Six classes of Matter

In Jaina Philosophy Matter is classified into six groups from the stand-point of grossness and fineness in its size, viz. bādarabādara, bādara, bādara-sūkṣma, sūkṣma-bādara, sūkṣma and sūkṣma-sūkṣma² (grossest, gross, gross-fine, fine-gross, fine and finest). Pudgala-skandha (molecule) whose chedana (penetrability of penetration or cutting), bhedana (division or divisibility) and prāpaṇa (portability) may generally be possible is called bādara-bādara (grossest), e. g. solids like earth, stone, etc. Pudgala-skandha whose penetration and division are not possible but portability can be possible is called bādara (gross), e. g. liquids like molten butter, water, oil, pudgala-skandha whose penetration and division and portability can not be possible at all, but which is apprehended by the eyes is called bādara-sūkṣma (grossfine), e. g. heat, light, electricity and magnetism. The ultra visible but intra sensual-molecules tangible to the four sense-organs except the visual organ are called sūkṣma-bādara (fine-gross), e. g. gases with air and others. The molecules which are ultra-sensual matters are called sūkṣma (fine). It is responsible for thought activities and is beyond the sense-perception. The finest ultimate-atom is called sūkṣma-sūkṣma, because firstly, it is the finest of all forms of matter,

1. Khamdham sayalasamattham tassa ya addham deso iti Addhaddham ca padeso ayibhāgi ceva paramāṇu, GS., Jīva., 604.
2. Bādara-bādara bādara bādara-suhumam ca suhumabādaram ca Suhumam ca suhumasuhumam dharādiyam hodi chab-bheyam", GS., Jīva., 602; see Niyamasāra, 21.

secondly, only paramāvadhiññānin (one endowed with transcendental knowledge) and Kevalajñānin (omniscient) can apprehend it. Other persons can know it only by inference with regard to the mark of its effect.¹

It is to be noted here that these six divisions of Matter—grossest to finest can be reduced to the three divisions of Matter in the physical sciences in three states, viz. solid, liquid and gaseous. The remarkable feature in them is that the molecular structure is common to all the three states, whereas the difference lies only in the closeness with which the molecules comprising them are packed.

In a solid, the molecules are put closely together, so the intermolecular forces of cohesion are greater than the molecular tendency to disintegrate. As a result of this fact the molecules are held to each other with a strong force which enables a solid to maintain a definite shape and volume and to put a great resistance to any change in either of them. For this reason a solid possesses high rigidity, high volume and elasticity.

In a liquid, the molecules are placed less closely together than they are packed in a solid, so a liquid promptly submits to any external force tending to change its shape on account of much smaller cohesion in it. Thus it has no definite shape, but it can maintain its volume and quite large force, though comparatively smaller than that in a solid to change it a little.

1. GS., JIva., 603;

Bhūpavvadamaḍiḃyā bhaṇiḍā aithūlathūlamidi khaṁdhā
Thūlā idi viṇṇeyā sappijalatelamaḍiḃyā—Niyamasāra, (22);
Chāyātavamāḍiḃyā thūledarakhaṁdhamidi viyāṇāhi
Suhumathūledi bhaṇiyā khaṁdhā caurakkhavisayā ya,
Ibid. (23);
Suhumā havanti khaṁdhā pāvoggā kammavaggaṇassapuṇo
Tavvivariyā khaṁdhā aisuhumā iti purūveṁḍi,
Ibid. (24)

In a gas, the molecules exist widely separated from each other, hence intermolecular attraction is almost absent and they move about as being independent of each other within the limitation of the walls of the containing vessel. It cannot preserve any definite shape or volume but pervades the whole of the containing vessel readily. So it cannot offer any appreciable resistance to any change either in shape or in volume.

TWENTY-THREE VARGAṆĀS (CLASSES) OF MATTER

The group of matters of the same numerical value is called vargaṇā (class). As for example, individual ultimate atoms (paramāṇus) which exist in the entire cosmic universe (lokākāśa) is called the first vargaṇā. The aggregate which is formed by the combination of two ultimate atoms is called the second vargaṇā. The aggregate which is formed by the combination of three ultimate atoms is stated to be the third vargaṇā. In this way, on the increase of one — one ultimate atom the aggregates (skandhas), having countable, countless and infinite and infinitesimal infinite units of matter are to be known as saṁkhyātāṇuvargaṇā, asaṁkhyātāṇuvargaṇā, anantāṇuvargaṇā and anantānantāṇuvargaṇā¹ respectively.

All these vargaṇās, because of having alpaparamāṇus (less or small quantity of ultimate atoms) cannot be received by soul. For this reason these are called agrāhya or agrahaṇa vargaṇās (non-receivables). But the aggregates which are formed of ultimate atoms which are infinite times more than the number of abhavya-jīvas (beings unfit to attain liberation) and infinitesimal part of siddhajīvas (perfect beings or souls), i. e. the aggregates in which there are such numbers of ultimate atoms are receivable by Soul.

1. Iḍadugaṇigāi jā abhavaṇamtaguṇiyāṇā

Khaṁ dhā uralociyavaggaṇā u taha agahaṇamṭariyā,

Pañcama Karmagrantha, 75.

On receiving them, Soul transforms its own gross body. For this reason these aggregates are called *audārika vargaṇā*. But this *vargaṇā* is the most minimum of all the receivable *vargaṇās* of the gross body. In addition to it, there being an increase of ultimate atom by the gradual order of one unit (*pradeśa*), the first, the second, the third, the fourth, the fifth, etc., upto infinite *vargaṇās* of *skandhas* become *grāhya vargaṇās* (receivable classes) of the gross body. Therefore, the receivable maximum *vargaṇās* of the gross body becomes more by the infiniteth part than the receivable minimum *vargaṇās* of the gross body. In this infiniteth part there are infinite ultimate atoms. So the *vargaṇās* from the minimum to the maximum should be known as the *grāhya vargaṇās* (receivable classes) of the gross body.

In addition to the maximum *vargaṇā* of the gross body, the *vargaṇās* of *skandhas* which are formed as a result of the increase of ultimate atoms by the order of one unit (*pradeśa*) to each of them are firstly possessed of more number of units of ultimate atoms than that of the gross body on the one hand; secondly they are fine; therefore, they become *grāhya vargaṇās* (receivable classes) of the gross body. And they are having less number of units of ultimate atoms and are grosser than *skandhas* of which the transformable-body (*vai-kriyika śarīra*) is formed. Therefore, they are not capable of being received by the transformable body. Thus ananta *vargaṇās* (infinite classes) of *skandhas*, because of there being an increase of ultimate atoms by the order of one unit (of ultimate atom) to each of them in addition to the maximum *vargaṇā* of the gross body (*audārika śarīra*), become unfit to be received (i. e. non-receivable). As for example, the maximum *vargaṇās* of the gross body is more by infiniteth part than its receivable minimum *vargaṇās*. Similarly, the non-receivable maximum *vargaṇā* should be known to be infinite times more (i. e. having infinitefold ultimate atoms) than the non-receivable minimum *vargaṇā*. In this way the receivable *vargaṇās* are alternately placed, i. e. there comes the non-

receivable vargaṇā after the receivable vargaṇā and the receivable vargaṇā after the non-receivable vargaṇā.¹

The collection-like (group-like) vargaṇā of those skandhas in which there is found one ultimate atom more than the number of ultimate atoms existing in a skandha of non-receivable maximum vargaṇā is the receivable minimum vargaṇā of the transformable body (vaikriyika śarīra). The collection-like (group-like) second vargaṇā of those skandhas in which there is found one more unit of ultimate atom than the number of units (of ultimate atoms) of the minimum vargaṇā is the receivable vargaṇā of the transformable body (vaikriyika śarīra). Like this infinite vargaṇās of skandhas having an addition of ultimate atoms by the order of one unit (of ultimate atom) more to each of them become the receivable vargaṇās of the transformable body. Therefore, the receivable maximum vargaṇā of the transformable body becomes more by the infiniteth part than its receivable minimum vargaṇā. The vargaṇā which is of skandhas having one unit more than the receivable vargaṇā of the transformable body is having much more units than the transformable body and is fine; and it is having less number of units than the translocation body (āhārakaśarīra) and is grosser than it. Therefore, it is neither useful to the transformable body nor to the translocation-body. For this reason it is called non-receivable vargaṇā. It is the minimum vargaṇā. In addition to it, the infinite vargaṇās of skandhas having the increase of units (of ultimate atom) by the order of one unit are non-receivable. The vargaṇā of

1. Egā paramāṇuṇaṃ eguttaravaḍḍhiyā tao kamaṣo
 Saṃkhejjapaesaṇaṃ saṃkhejjā vaggaṇā hoṃti. 636
 Tatto saṃkhāiā saṃkhāiyappaesaṇaṃ
 Tatto puṇo aṇaṃtānaṃtapaesaṇa gaṃtuṇaṃ 637
 Orāliyassa gahaṇappāoggā vaggaṇā aṇaṃtāo
 Aggaṇappāoggā tasseva tao aṇaṃtāo 638
 Evamaḥoggā joggā puṇo ajoggā ya vaggaṇānaṃtā,
 Viśeṣavaśyakabhāṣya, 636, 637, 638.

skandhas having one unit more than the non-receivable maximum vargaṇā becomes the receivable minimum vargaṇā of the translocation-body (āhāraka śarīra). There becomes the receivable maximum vargaṇā of skandhas of the translocation-body, having the number of more units by the infiniteth part than this minimum vargaṇā of the translocation-body.

There becomes the non-receivable minimum vargaṇā of the skandhas having one atomic unit more than the receivable vargaṇā of the translocation-body. In addition to that, there being an increase of atomic units infinite times more than the minimum vargaṇā by the order of one atomic unit, there becomes the non-receivable maximum vargaṇā. Thus these infinite vargaṇās are having much more atomic units than the translocation-body and are fine; and they are having less number of atomic units than the luminous-body, and are grosser than it; therefore, they are not receivable. The vargaṇā of skandhas having one atomic unit more than the maximum non-receivable vargaṇā becomes prāyogyajaghanya vargaṇā of the luminous-body. There being an increase over that by the order of one atomic unit, there becomes the maximum vargaṇā of skandhas having infiniteth part more atomic unit of prāyogya (applicable) minimum vargaṇā of the luminous-body.

There becomes the minimum non-receivable vargaṇā of skandhas having one atomic unit more than a skandha of the receivable maximum vargaṇā of the luminous-body. In addition to that, there being an increase of atomic units by the order of one atomic unit, there becomes the maximum non-receivable vargaṇā of skandhas having atomic units infinite times more than the minimum non-receivable vargaṇā. Like this these infinite non-receivable vargaṇās are having much more atomic units than the luminous-body and are fine, and they are having less number of units than speech and are grosser than it. Therefore, they are not receivable. The vargaṇā of skandhas having one unit more than the maximum non-receivable vargaṇā, becomes the bhāṣā-prāyogya-jaghanya-vargaṇā.

(minimum vargaṇā fit to be speech). In addition to that, there being the increase of units by the order of one, there becomes bhāṣā-prāyogya-utkrṣṭa-vargaṇā (maximum vargaṇā fit to be speech) of skandhas having units more by the infiniteth part than the minimum vargaṇā. Thus the infinite vargaṇās become receivable in the case of bhāṣā.

There becomes the non-receivable minimum vargaṇā of skandhas having one unit more than skandhas of receivable maximum vargaṇā of bhāṣā. In addition to that, there being an increase of units by the order of one unit, there takes place the non-receivable maximum vargaṇā of skandhas having units infinite times more than the receivable vargaṇā. The vargaṇā of skandhas having one unit more than skandhas of this vargaṇā becomes the receivable minimum vargaṇā of respiration. In addition to it, there being an increase of units by the order of one unit, there becomes the maximum non-receivable vargaṇā of respiration of skandhas having infiniteth part more (unit) of the units of skandhas of the minimum vargaṇā.

There becomes the non-receivable minimum vargaṇā of skandhas having one unit more than skandhas of the receivable maximum vargaṇā of respiration. In addition to that, there being an increase of units by the order of one unit, there becomes the maximum non-receivable vargaṇā of skandhas having units infinite times more than the units of skandhas of the minimum non-receivable vargaṇā. There becomes manodravya's (mind-substances) receivable minimum vargaṇā of skandhas having one unit more than skandhas of that vargaṇā (respiration). In addition to that minimum vargaṇā, there being an increase of units by the order of one unit, there becomes the manodravya's receivable maximum vargaṇā of skandhas having the infiniteth part more unit than the units of the skandha of the minimum vargaṇā.

There becomes the non-receivable minimum vargaṇā of the skandhas having one unit more than the receivable maximum

vargaṇā of the mind-substance. In addition to that, there being an increase of units by the order of one unit, there takes place the non-receivable maximum vargaṇā of skandhas having units infinite times more than the units of the skandhas of the minimum vargaṇā. The vargaṇā of skandhas having one unit more than the units of skandhas of this maximum vargaṇā is the receivable minimum vargaṇā of karma (fit to be received). In addition to that, there being an increase of units by the order of one unit, there becomes karma's receivable maximum vargaṇā of skandhas having infiniteth part more unit of the minimum vargaṇā.¹

In brief it can be summed up that there are infinite times more ultimate atoms in one aggregate of the maximum non-receivable vargaṇā than whatever number of ultimate atoms are existing in one aggregate of the minimum non-receivable vargaṇā and there are infiniteth part more ultimate atoms in the aggregates of the maximum receivable vargaṇā than whatever number of ultimate atoms are existing in the aggregates of one minimum receivable vargaṇā. In this way eight vargaṇās are receivable and eight vargaṇās are non-receivable. From amongst these sixteen vargaṇās there are stated to be two main alternatives of each of them and there are infinite intermediate alternatives between the minimum and the maximum (or from the minimum to the maximum). The maximum of the receivable vargaṇā is the infiniteth part more than its minimum and the maximum of the non-receivable vargaṇā is infinite times more than its minimum. Thus there are stated to be eight receivable vargaṇās, viz. receivable vargaṇās of gross—, transformable—, translocation— and luminous-bodies, speech, respiration, mind and karma (karmic body).²

1. Pañcama karmagrantha, p. 211;

see Notes of Pandit Sukhlalji.

2. Emeva viuvvā-hāra-teya-bhāsa-ṇupāṇa-maṇa-kamme
Suhumā kamāvagāho ūṇṇaṅgula-asamkhamso,
Pañcamakarmagrantha, 76

The five kinds of bodies—audārika (gross) upto kārmaṇa (karmic body) are finer by the successive order; nevertheless, the use of ultimate atoms is made more and more in their respective formations. As for instance, though cotton, wood, earth, stone and iron are accepted in some particular magnitude or quality (parimāṇa), still the size of wood is smaller than that of cotton, that of earth is smaller than that of wood, that of stone is smaller than that of earth and that of iron is smaller than that of stone. But these things, even being smaller in size from one another, are more solid and heavy by the successive order. Just like that the account of the five bodies should be understood. The reason is this that pudgalavargaṇās of which the gross body is formed are having less number of ultimate atoms like cotton, but they are gross in size; pudgalavargaṇās of which the transformable body is constituted are having more number of ultimate atoms than that of pudgala-vargaṇā fit to be gross body like wood, but they are less in size. In this way the account of the bodies should be known according to the successive order. It means that the number of ultimate atoms increases more and more in the cases of successive vargaṇās, but their size becomes finer and finer. That is to say, as there takes place a combination of more ultimate atoms, so there occur their finer and finer transformations¹ successively. Therefore, the immersion of audārikavargaṇās is innumerableth part of a cubic finger and that of its non-receivable vargaṇā is also innumerableth part of one cubic finger, but the innumerableth part of this cubic finger is less than the previous one. Like this the immersion of vaikriyika-grahaṇavargaṇā also is the innumerableth part of a cubic finger, but this innumerableth part is less than the innu-

1. Paraṁ paraṁ sūkṣmaṁ, pradeśato asaṁkheyaguṇaṁ
prāk tejasāt, TS., 2. 38, 39 ;
Anantaguṇe pare, Ibid., 2.40; Apratigbāte, Ibid., 2.41
The closeness of atoms makes the body compact and solid
by virtue of cohesion according to the physical sciences.

merableth part of a cubic finger having the immersion of audā-rikagrahaṇayogyavargaṇā (pudgalavargaṇā fit to be received for the formation of gross body). Similarly, the innumerableth part of a cubic finger should be understood lesser and lesser also. On account of this decrease (nyūnatā) even there being the perception of the gross body having less number of ultimate atoms, the co-existent luminous and karmic bodies having much more number of ultimate atoms successively are not perceptible.

Speech, respiration and mind lie in between the luminous and karmic bodies. That is, vargaṇās which undergo transformations as sound at the time of speaking are finer than the receivable vargaṇās of the luminous body. And vargaṇās which undergo transformation as respiration of beings are finer than these bhāṣāvargaṇās. From this fact, it is inferable how much more fine are karmavargaṇās, but the number of ultimate atoms are more in them. This analysis throws light upon the outlines of the nature of those things which undergo transformation as karma.

In addition to these karmavargaṇās, there are stated to be the following vargaṇās, viz. dhruvavargaṇā (fixed molecule), sāntaranirantara-vargaṇā (Inter-non-inter-molecule) (or adhruvavargaṇā—non-fixed molecule), śūnyavargaṇā (indifferent molecule), pratyekaśarīravargaṇā (individual body-molecule), dhruva-śūnya-vargaṇā (fixed indifferent molecule), bādara-nigoda-vargaṇā (gross-common-body-molecule), śūnyavargaṇā (indifferent molecule), sūkṣmanigoda-vargaṇā (finer-common-body-molecule), śūnyavargaṇā or nabhavargaṇā (indifferent or sphere-molecule) and mahāskandhavargaṇā (great molecule).¹

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1. Anusaṁkhāsāṁkhejjāṇaṁtā ya agejjagehiṁ aṁtariyā,
Āhāratejabhāsāmaṇakammaiyā dhuvakkhaṁdhā,
Sāntaranirāṁtareṇa ya suṇṇā patteyadehadhuvasuṇṇā
Bādarānigodasuṇṇā suhumanigodā nabho mahakkhaṁdhā,
GS., Jīva, 594, 595, p. 294;

It appears from the above analysis of *vargaṇās* of *Pudgala* that whatever is visible is not the final units of Matter.

Five hundred and thirty classes of Matter

In Jaina Metaphysics Matter has been classified into five hundred thirty groups from the point of view of the prominence of its qualities—colour, taste, smell, touch and shape on the basis of their respective predominance in their substratum. It has been divided into one hundred groups by accepting colour as primary and other qualities as secondary $5 (5 + 2 + 8 + 5) = 100$, one hundred groups by accepting taste as primary and others as secondary, forty-six groups by regarding smell as primary and others as secondary, one hundred eighty four groups by accepting touch as primary and others as secondary and one hundred groups by accepting shape as primary and others as secondary.¹ Thus the total number of these classes of Matter is five hundred and thirty.

It is stated in the *Prajñāpanā Sūtra* that those which are *kālavarṇapariṇatapudgalas* (black-coloured-transformed matters) with regard to colour are *surabhiḡandha-pariṇata* and *dura-bhiḡandhapariṇata* (pleasant and unpleasant-smell-transformed) with regard to smell; *tiktarasapariṇata* (bitter taste-transformed), *katukarasapariṇata* (sour-taste transformed), *kaṣāya-rasapariṇata* (astringent taste-transformed), *amla-rasapariṇata*

Paramāṇusaṁkha-asamkhā-aṇāntapaesā abhavvaṇāntaguṇā
Siddhāṇāntabhāgo āhāragavaggaṇā tītaṇū (18)

Agahaṇāntariyāo teyagabhāsāmaṇe ya kamme ya
Dhuva-adhuva-accittā suṇṇa-cau-aṁtaresuppiṁ (19)

Patteyagataṇusa bāyarasuhuma—nigoe taḥā mahakkhamdhe
Guṇanipphannasanāṁā samkhabhāgaṁgulavagāho (20)

Karmaprakṛti (Bandhana-karaṇa)

Kammovariṁ dhuveyarasuṇṇā patteyasuṇṇabāyariyā (16)

Suṇṇā suhumā suṇṇā mahakkhamdho saguṇanāmāo

Pañcasamgraha, Bandhanakaraṇa, Vide Pañcamakarma-grantha, p. 214.

1. *Paṇṇavanā, I. Rūvi ajīvapaṇṇavanā.*

(acidic-taste-transformed), and madhurarasaparīṇata (sweet taste-transformed) with regard to taste, karkaśasparśa-parīṇata (hard touch-transformed), mṛdusparśaparīṇata (soft touch-transformed), gurusparśaparīṇata (heavy-touch-transformed), laghusparśa-parīṇata (light-touch-transformed), śītasparśa-parīṇata (cold-touch-transformed), uṣṇasparśaparīṇata (hot-touch-transformed), snigdhasparśaparīṇata (smooth or cohesive touch-transformed), and rūkṣasparśaparīṇata (rough or dry touch-transformed) with regard to touch; parimaṇḍalasamsthānaparīṇata (spherical shape transformed), vṛttasamsthānaparīṇata (circular shape-transformed), tasrasamsthānaparīṇata (triangular shape-transformed), caturasrasamsthānaparīṇata (square shape-transformed) and āyata-samsthānaparīṇata (rectangular shape-transformed) with regard to shape (20). Those which are nīla-varṇaparīṇata (blue-colour-transformed) from the point of view of colour are surabhigandhaparīṇata and durabhigandhaparīṇata from that of smell, tiktarasaparīṇata, kaṭukarasaparīṇata, kaṣāyarasaparīṇata, amlarasaparīṇata and madhurarasaparīṇata from that of taste; karkaśasparśaparīṇata, mṛdusparśaparīṇata, gurusparśaparīṇata, laghusparśaparīṇata, śītasparśaparīṇata, uṣṇasparśaparīṇata, snigdhasparśaparīṇata and rūkṣasparśaparīṇata from that of touch; parimaṇḍala-samsthānaparīṇata, vṛttasamsthānaparīṇata, tasrasamsthānaparīṇata, caturasrasamsthānaparīṇata and āyatasamsthānaparīṇata from that of shape (20). Those which are lohita-varṇaparīṇata (red colour-transformed) with regard to colour are surabhigandhaparīṇata and durabhigandhaparīṇata with regard to smell, tiktarasaparīṇata, amlarasaparīṇata and madhurarasaparīṇata with regard to taste; karkaśasparśaparīṇata, mṛdusparśaparīṇata, gurusparśaparīṇata, laghusparśaparīṇata, śītasparśaparīṇata, uṣṇasparśaparīṇata, snigdhasparśaparīṇata and rūkṣasparśaparīṇata with regard to touch, parimaṇḍalasamsthānaparīṇata, vṛttasamsthānaparīṇata, tasrasamsthānaparīṇata, caturasrasamsthānaparīṇata and āyatasamsthānaparīṇata (20), with regard to shape. Those which are haridravarṇaparīṇata (yellow colour-transformed) from the point of view of colour.

are surabhigandhapariṇata and durabhigandhapariṇata (pudgala) from that of smell; tiktarasapariṇata, kaṭukarasapariṇata, kaṣāyarasapariṇata, amlarasapariṇata and madhurarapariṇata from that of taste, karkaśasparśapariṇata, mṛdusparśapariṇata, gurusparśapariṇata, laghusparśapariṇata, śītasparśapariṇata, uṣṇasparśapariṇata, snigdhasparśapariṇata and rūkṣasparśapariṇata from that of touch; parimaṇḍalasaṁsthānapariṇata, vṛttasaṁsthānapariṇata, tāsasaṁsthānapariṇata, caturasrasaṁsthānapariṇata and āyatasamsthānapariṇata from that of shape (20). Those matters which are śuklavarnapariṇata (white colour—transformed) from the aspect of colour are surabhigandhapariṇata and durabhigandhapariṇata from that of smell, tiktarasapariṇata, kaṭukarasapariṇata, kaṣāyarasapariṇata, amlarasapariṇata and madhurarapariṇata from that of taste; karkaśasparśapariṇata, mṛdusparśapariṇata, gurusparśapariṇata, laghusparśapariṇata, śītasparśapariṇata, uṣṇasparśapariṇata, snigdhasparśapariṇata and rūkṣasparśapariṇata from that of touch; parimaṇḍalasaṁsthānapariṇata, vṛttasaṁsthānapariṇata, tāsasaṁsthānapariṇata, caturasrasaṁsthānapariṇata and āyatasamsthānapariṇata from that of shape (20). Thus there are stated to be one hundred groups of matter in this classification from the stand-point of predominance of colour as primary quality and non-predominance of other qualities as secondary.

In this way Matter has been classified into the remaining four hundred thirty groups from the points of view of predominance of smell, touch and shape respectively. It is to be analysed whether the quality of primary as well as secondary importance in the transformed piece of matter is inherent in the component parts of it or emergent from the aggregation due to some chemical behaviour in it.

According to the physical sciences, it can be said in regard to colour, taste and odour that colour is the important physical property and the apparent colour of a material substance is conditional upon its state of sub-division; it becomes lighter as large particles are grouped up into smaller ones. Taste and

odour are the chemical properties in the matter as they are closely correlated with the chemical nature of the material substances.

Infinite classes of Matter

There are stated to be infinite classes¹ of matter with regard to its jāti (category)—*anujāti* (ultimate atom) and *skandhajāti* (molecule). All ultimate atoms are not of the same conditions. All the conditions of qualities of colour, taste, smell and touch do not exist in one ultimate atom. There may exist in one ultimate atom any one colour, any one taste, any one smell and any two unopposed touches between warm-cold and cohesive-dry. Ultimate atoms in which similar colour, taste, smell and two touches exist will be stated to be belonging to one jāti (category). Similarly, ultimate atoms are of different jāti (category) due to the cause of possible combinations of the sub-divisions of colour, taste, smell and touch. Like this *skandha* (aggregate) is of various jātis (category). In the *Rājavārtika*, while commenting on the aphorism “*Āṇavaḥ skandhāśca*”, *Akalanika* explains it in this manner; “*Ubhayātra jātyapekṣaṁ bahuvacanaṁ—anantabhedā’api pudgalā anujātyā skandhajātyā ca*”. In this sūtra the use of these plural words “*āṇavaḥ*” and “*skandhāḥ*” has been made from the point of view of jāti. Matter is of infinite classes from the point of view of *anujāti* and *skandhajātis*. He has explained it further by stating : “*dvaividhyamāpadyamānāḥ sarve gr̥hyanta iti tajjātyādhārānantabhedasāmsūcanārthaṁ bahuvacanaṁ kriyate.*”

Infinite classes of Matter² are discussed from the state of

1. BhS., 25. 4. 740; *Ubhayātra jātyapekṣaṁ bahuvacanaṁ* (3) *anantabhedā’api pudgalā anujātyā skandhajātyā ca dvaividhyamāpadyamānāḥ sarve gr̥hyanta iti tajjātyādhārānantabhedasāmsūcanārthaṁ bahuvacanaṁ kriyate*, RV., p. 491.
2. BhS., 25. 4. 740; BhS. 20. 5. 670; TS., p. 439.

the part of its quality. There is the degree of the capacity in the characteristics of Matter—colour, taste, smell and touch. As for example, blackness in black coloured matters is not equal in all of them. Some one is of onefold blackness, i. e. the lightest blackness in comparison with which there cannot be any lightest black colour—indivisible part of blackness which is unitary; some may be numerablefold black; some may be innumerablefold black and some may be infinitesimal fold black. This degree of qualities exist in both ultimate atoms and molecules. In this way Matter has been classified into infinite groups from the points of view of the degree of the parts of its qualities—colours, tastes, smells and touches.¹

There are also infinite classes of Matter with regard to its modes. Matter is subject to modification on account of the process of combination and dissociation. Matter undergoes modifications by the process of integration into the forms of colour, taste, smell, touch and shape and thus it assumes *vyañ-janaparyāyas*, (periodic modifications.) From the point of view of these infinite modes, Matter has been classified into infinite groups, as for instance, sound, heat, light, darkness, water, earth, cloud, etc.² The classification of *Pudgala* (Matter) into infinite groups from the points of view of *jāti* (category), part of quality (*guṇāmśa*) and mode or modification is comparable to the analysis of matter of the physical sciences from the point of view of subject (substance), predicate (quality) and relations (modes).

1. Jaina Padārtha-vijñāna men Pudgala, pp. 41-49.

2. Ibid., p. 50.

EIGHT CHAPTER

ATOMIC STRUCTURE OF MATTER AND PROPERTIES OF ATOM

FIRST SECTION

ATOMIC STRUCTURE OF MATTER

In continuation of the fourth chapter on Atomism it is necessary further to have a detailed discussion of the atomic structure of Matter, the nature and properties of atom in relation to the Brāhmanical and Buddhist views on them.

In Jaina Philosophy paramāṇu (ultimate atom) is studied from the points (locus or field), kāla (time) and bhāva (condition), as it is the finest particle of Matter the further division of which is not possible; it is identical with one space-point and one unit of time (kṣaṇa-samaya), and is endowed with quality and it is ever changing in nature.¹

Paramāṇu is an indivisible unit of Matter; it is the finest of all forms of Matter; the finest point of space is an indivisible one space-point; the finest unit of time is an indivisible instant; and the finest unit of quality of Matter is bhāva-paramāṇu (atom of quality). So Jaina Mataphysics mentions dravya-paramāṇu (atom of material substance), kṣetraparamāṇu (atom of space), kālaparamāṇu (atom of time) and bhāva-paramāṇu (atom of quality).²

1. From the general point of view Paramāṇu is one "egeparamāṇu", Sthā. I; BhS., 25. 4. 70; 20. 5. 670; Ācārāṅga Cūrṇi, p. 195; Uttarādhyayana Sūtra, Tīkā (Kamala Saṁyama), p. 99.
2. Goyamā ! cauvihe paramāṇu pa. taṁ—davvaparamāṇu, khettaparamāṇu, kālaparamāṇu, bhāvaparamāṇu, BhS., 20. 5. 670.

One point of space is the last limit of the division of space, i. e. partless. As pointed out, paramāṇu is partless, it has no inner and outer parts. That is why it is the finest particle of Matter from the point of view of field or locus; it exists only in one space-point. It is a momentary unit in this sense that a samaya or kṣaṇa is the indivisible unit of time, so also paramāṇu is an indivisible unit of Matter; the movement of a paramāṇu from one space-point to another is measured by a samaya or kṣaṇa (instant), for this reason it is identical with a momentary unit of time. The properties of a paramāṇu are also in a state of flux, undergoing transformation. A paramāṇu is so finest in form that it is touched by air, but it does not touch air.¹

The Jaina Ācāryas of both the Śvetāmbara and Digambara traditions have used this word "Paramāṇu" and interpreted it in the following manner: Paramāṇu is the cause of the formation of pudgalaskandha (molecule); it comes into being out of the division of skandha at last². Hence it is the smallest and finest form of Matter and it is permanent.³ It is eternal from the point of view of substance and non-eternal from that of condition of colour, smell, taste and touch.⁴

Causative Atom and Ultimate Discrete Atom (Kāraṇāṇu and Anantāṇu)

Dravyaparamāṇu (atom of material substance) is called paramāṇupudgala (atomic matter) from the general point of

1. Gayamā ! paramāṇupoggale vāyuāṇaṁ phuḍe no vāyu-āye paramāṇupoggaleṇaṁ phuḍe, BhS., 18. 10. 644.
2. Goyamā ! esa ṇaṁ poggale tītaṁ ceva jāva egaruve siya, Bhs., 14. 4. 510;
Bhedādanuḥ, TS., V. 27.
3. Sūkṣmo nityaśca bhavati paramāṇuḥ, Uttarā. Tīkā (Śānti Ācārya, p. 24.
4. Goyamā ! davvaṭṭhayāe sāsae vaṇṇapajjavehiṁ jāva phāsa-pajjavehim asāsae teṇaṭṭheṇaṁ jāva siya sāsae asāsae, BhS., 14. 4. 512.

view or in short it is called paramāṇu (ultimate atom).¹ All pudgalas (forms of matter) are paramāṇus from the real or noumenal point of view, but a paramāṇu does not exist always in the form of this state. According to the intrinsic nature of combination and dissociation, an aggregate-form of paramāṇus, which is produced or manifested as a result of combination of one paramāṇu with another due to the organic process of activity or application (prayoga) of beings or with the organic process of application of beings (Vaisrasika) is called skandha (molecule). In this aggregation a group of combined paramāṇus, sometimes being subject to the law of division (bhedādanu)² or to that of integration and disintegration (Saṅghāta-bhedebya utpadyante)³ again can attain their respective discrete state. Paramāṇus⁴ are called Kāraṇāṇu (causative atom) from the point of view of combination and anantāṇu (ultimate discrete atom) from that of dissociation or disintegration. That is, Matter consists of two forms, viz. paramāṇu and skandha from the physical aspect of its nature. Here the point arises how do they exist in the spatial Universe. It is traikālika (of three points of time) and is subject to transformation by artificial (i. e. applied) and natural processes.⁵

Nature of Atom in the Light of the Nature of Matter

Paramāṇu is a material substance and it is attributed by the name 'dravyaparamāṇu'. It is permanent and fixed (constant) in number, for it does not give up its individuality and class, even undergoing transformation into a molecular form. It observes the law of conservation of Mass, for no paramāṇu is destroyed nor goes out of existence and no paramāṇu originates in the universe. The number of paramāṇus, which was in the past, exists at present and will exist in future. Para-

1. BhS., 20. 6. 670.

2. TS., ch. V. 27.

3. TS., ch. V. 26.

4. TS., ch. V. 27.

5. BhS., 14. 4. 510.

māṇu is non-living, because there is no essential quality of livingness in it. It possesses existentiality (i. e. quality of being) which is inferable by the mark of its effect. It is devoid of mass, for it is a unitary material substance, but it possesses a capacity to become corporeal or to assume a form of mass or corporeality by combining with other paramāṇus.¹ So paramāṇu can be called corporeal because of its capacity of assuming corporeality.

There are only four inherent properties in paramāṇu, viz. colour, smell, taste and touch, but it is devoid of shape. The shape 'āyata' (oblong) commences only from a combination of two paramāṇus having two space-points² or units. A paramāṇu is endowed with a capacity of kriyā (activity or movement); it can move from one place to another and make movements, but its movements are uncertain, i. e. accidental. It does not disintegrate nor does it break up or split up nor does it get scattered nor does it itself integrate by getting disintegrated, broken up and scattered. But it attains aggregation by combining with another paramāṇu or paramāṇu and it dissociates from that aggregation by giving up that state. A paramāṇu is not of the

1. Paramāṇuprabhṛtayo' anantānantapradeśaskandhaparyavasānāsta eva rūpavattīmananyasādhāraṇīmanekarūpa-pariṇatisāmarthyāpāditasūkṣmasthanūlavīṣeṣāvīṣeṣaprakarṣa-prakarṣavartinīm bibhrati, TS. Bhā. Tī., p. 325;
Matrāvadhāryate, taddhi na jātucidaticiraparicitaparamāṇudvyaṇukādikramavṛddhadravyakālapamujjhati
sāmarthyācca pudgalā api na tām viḥaya vartante, atah pudgalā eva rūpiṇa iti suṣṭhūcyate, Ibid.
2. Eṣāmiti pudgalānām paramāṇudvyaṇukādikramabhājām uktalakṣaṇām rūpam mūrtiḥ sa vidyata iti rūpiṇaḥ, TS, Bhā. Tī, p. 325;
Pārthivāpyataijasavāyaviyaṇavao ' apyekajātyāḥ kadācit kāñcit pariṇatīm bibhrato na sarvendriyagrāhyā bhavanti, ato rūparasagandhasparaśā eva viśiṣṭapariṇāmānugṛhitāḥ santo mūrtivyapadeśabhājo bhavanti, TS., p. 324.

nature of disintegration and integration in its self-evident or discrete state, but a skandha of paramāṇus has the nature of integration and disintegration. Therefore, a paramāṇu is of the nature of integration and disintegration in its collidye or (combined) form. It is of the changing nature; it itself is changeable in state of neither heaviness nor lightness (agurulaghubhāva). This agurulaghupariṇāma (transformation of the quality of neither heaviness nor lightness) takes place in the parts of qualities—colour, taste, smell, and touch. A paramāṇu, while combining with another, can be transformed by the latter.

Paramāṇus are infinite in number.¹ In spite of the fastest speed of motion of a paramāṇu, it is not capable of going to Aloka (Non-Universe); its motion is everywhere in Loka (Universe). Therefore, a paramāṇu is called Loka-paramāṇu (co-extensive with the Universe).² As pointed out, it does come in the service of Soul in its natural state.³

According to the physical sciences, "the outstanding property that all atoms possess is that of mass. Mass is of course, an important parameter in the study of the motion of atoms by themselves as well as in the study of the motion of collections of atoms, i. e. of solid bodies and fluids. Since Avogadro's number is large, we know that ordinary qualities of materials, contain very large number of atoms."⁴

NATURE OF PARAMĀṆU (ATOM) IN THE SĀMĀKHYA-YOGA PHILOSOPHY

The Sāṃkhya-Yoga Philosophy admits the material existence paramāṇu (atom), but not as the unit of Matter and

1. Paramāṇu poggalā ..aṇāntā, BhS., 25. 4. 740.
2. Paramāṇupoggale ṇaṁ logassa puracchimillaṁ taṁ ceva jāva uvarillaṁ carimantaṁ gacchai, BhS., 16. 8. 584.
3. Ibid., 18. 4. 662.
4. Physics, pp. 299-300.

the ultimate cause of the material universe. As pointed out, paramāṇu of this system of thought is janyapadārtha (produced entity) but not an eternal entity like paramāṇus of the Nyāya-Vaiśeṣika and Jaina Metaphysics. It is evolved out of the first tanmātra (infra-atomic units of potential) which itself originates from Bhūtādi (rudiment Matter) under the operation of Rajas (Energy)¹ as a result of "the process of disintegration and emanation in the menstrum of surrounding medium of the unindividuated cosmic mass Mahat."²

A paramāṇu is the smallest portion of any substance, having the characteristic quality of it, i. e. it represents the smallest homogeneous part of any substance. It is not partless, hence it is divisible,³ for it is subject to dissociation. Here lies

1. Upaṣṭambhataḥ pariṇamayanti, Sāṃkhya Pravacanabhāṣya, 62, ch. I, p. 35.
2. Prakhyākriyāsthitiśtīlānām guṇānām grahaṇātmakānām karaṇabhāvenaikaḥ pariṇāmaḥ śrotamindriyaṁ grāhyātmakānām śabdabhāvenaikaḥ pariṇāmaḥ śabdo viśaya iti, śabdādīnām mūrtirsamānajatīyānāmekaḥ pariṇāmaḥ pṛthiviparamāṇustanmātrāvayavaḥ, teṣāṁ caikaḥ pariṇāmaḥ pṛthivī gaurvṛkṣaḥ parvata ityevamādiḥ, bhūtāntareṣvapi snehausṇyapraṇāmitvāvākāśādānānyupādāya sāmānyamekavikārārambhaḥ, samādheyāḥ, Yogabhāṣya, IV, 14, pp. 192-3; Vikaraṇabbhāvaḥ vikīrṇatāsvabhāvā vyāpitā iti yāvat, Yogavārtika on Patañjali's Sūtra Manojavittam Vikaraṇabbhāvaḥ, etc; Ākāśastu vikurvāṇaḥ sparśamātraṁ sasarja Balavānbhavadvāyustataḥ sparśa guṇo mataḥ Viṣṇupurāṇa;
See Sāṃkhyapravacanabhāṣya, p. 35: P. S. A. H., p. 29.
3. Apakarṣaparyantaṁ dravyaṁ paramāṇurevaṁ,
See Yoga Sū., 52, pāda III and V Bhā., p. 174;
Loṣṭasya hi pravibhajyamānasya yasminnavayave alpatva-tāratamyāṁ vyavatiṣṭhate so' apakarṣaparyantaḥ paramāṇu, Tattvavaiśāradī, Ibid., p. 174;

the difference between the atomicity of Matter of the Sāṃkhya-Yoga and the atomicity of Matter of the Jaina and Nyāya-Vaiśeṣika systems of thought, as the latter advocate that a paramāṇu is indivisible.

Dr. B. N. Seal explains the conception of paramāṇu in the Sāṃkhya-Yoga philosophy in this way : "In a mixed substance (militadravya, saṃhatabhūtārtha) whether it be an "isomeric" or a heterogenic compound, the quantities are due to the mixture, and therefore its paramāṇu (usually called Ārambhaka paramāṇu), the smallest homogeneous particle possessing its characteristic qualities, must result from the mixture of the paramāṇus (in smaller or larger numbers as the case may be) of the component substances. In the Sāṃkhya view, then, the paramāṇus of a mixed substance (Ārambhaka paramāṇu) corresponds to what we now call molecules."¹

According to the Sāṃkhya-Yoga Philosophy", a paramāṇu is a type of atoms corresponding to each Bhūta class, and indeed one and the same kind of paramāṇu may comprehend atoms of different masses, if only these should agree in their structural type."²

This nature of paramāṇu differs from the Jaina view of one class of paramāṇu, but it is akin to the Nyāya-Vaiśeṣika and Buddhist concepts of different classes of atoms corresponding to different elements of Matter. But the difference of views on the point lies in the fact that paramāṇus of the Sāṃkhya-Yoga are generated, whereas paramāṇus of the Nyāya-Vaiśeṣika are the ultimate causes of the material universe and the Buddhist paramāṇus are saṃghātaparamāṇus (combined atoms). In the Sāṃkhya-Yoga the generation of paramāṇus are conceived in the following order : "Ākāśa-atom

Nānunityatā na nirbhāgatvaṃ, pṛthivīparamāṇuḥ jala-paramāṇurītyādīvyavahārastu pṛthivyādīnāṃ apakarṣa-kāṣṭhābhīprāyeṇaiya, PBhā., V. 88. Vijñānabhikṣu.

1. P. S. A. H., p. 52.

2. Ibid., p. 40.

is generated by the sound-potential with accretion of rudiment—matter (Bhūtādi), the vāyu-atom is generated by the touch-potentials by combining with the vibratory particles (sound-potential); the Teja-atom is produced by the light and heat potentials by combining with touch-potential and sound-potentials; the Ap-atom is generated by the taste-potentials by combining with light and heat-potentials, touch-potentials and sound-potentials; and the Pṛthivī-atom is produced by the smell-potentials by combining with the preceding potentials. The Ākāśa-atom is endowed with the attribute of penetrability, the Vāyu-atom with impact of mechanical pressure, the Teja-atom with radiant heat-and-light, the Ap-atom with viscous attraction, and the Earth-atom with cohesive attraction.”¹

THE NYĀYA-VAIŚEṢIKA VIEW ON NATURE OF PARAMĀṆU (ATOM)

As already discussed in brief outlines in the fourth chapter, paramāṇu (ultimate atom) is conceived by the Nyāya-Vaiśeṣika Philosophy as the ultimate particle of Matter; it is absolutely without any magnitude, its measure is aṇu (smallest);² it is non-spatial³ and it has no inside or outside;⁴ it is intangible to the senses; its existence is inferable by the mind or intellect.⁵ No magnitude can be produced by the adding up of its measure,

1. P. S. A. H., pp. 38-39.

2. Mahato viparītaṁ aṇu, VS., VII. 1. 10.

3. NV., IV, ii, 25, p. 522, line 3.

4. NS., IV. ii. 20.

5. NV., p. 233 and NVTT., p. 271, line 7 from bottom etc;

Param vā truteḥ, NV., IV. ii, 12;

Truṭistrasareṇurīyanarthāntaram, jālasūryamarīcisthaṁ
strasareṇu rajaḥ smṛtaṁ, NV., p. 647;

Tasya kāryaṁ liṅgaṁ, VS., IV. 1. 2; VSU., VII, ii. 9.

as it is absolutely devoid of any magnitude. It is an eternal substance.¹

According to the Nyāya-Vaiśeṣika, paramāṇus are the ultimate constituents of bodies; they are indivisible and eternal² material substances. A continuous process of production is involved in their internal character, though they are themselves incapable of producing anything,³ for they are kūṭas-thanītya (absolutely permanent). As there are stated to be four classes of paramāṇus corresponding to four elements of matter, viz. earth-atom, water-atom, fire-atom and air-atom, so atoms of any specific element of matter are admitted to possess all the specific qualities of it. Therefore, the four specific qualities, viz. smell, taste, colour and touch are possessed by the four kinds of atoms respectively by the order : smell by earth-atom, taste by water-atom, colour by fire-atom and touch by air-atom.⁴ The specific qualities in the atoms of water, fire and air are eternal and constant, while those in the earth-atoms are subject to transformation (chemical action) under the influence of heat.⁵ So all the atoms, except earth-atom, of the same element of matter are qualitatively similar, but they are qualitatively dissimilar from the atoms of other elements of matter. The specific qualities of the four kinds of atoms are imperceptible, for they are unmanifest and inherent in intangible non-spatial atoms in which there is no gross magnitude accruing from the combination of parts.⁶ On account of this fact atoms are

1. Anitya iti viśeṣataḥ pratiśedhabhāvaḥ, VS., 4. 1. 4.

2. Ibid., Sadakāraṇavannityaṁ, Ibid., 4. 1.1;

Adravyatvena nityatvamuktaṁ, VS., II. i. 13; VV. II. 1. 13; KVBhā., p. 78.

3. NK., pp. 78-83; Avāntarabhedanirūpaṇārthamāha nityo cānitya ceti...kāryalakṣaṇā pṛthivī.

4. Kāraṇabhāvāt, kāryabhāvaḥ, VS., IV. i. 3.

5. Jñānanirdeśe jñānaniṣpattividhiruktaḥ, VS., VIII. 1. 13 and See VV.

6. Anekadravyasamavāyāt rūpaviśeṣācca rūpopatabdhīḥ, VS., IV. 1. 8;

imperceptible, for they are not possessed of gross magnitude (mahattva) and manifested colour (udbhūtarūpa)¹ in them. But they can be perceived by the yogin with his supernatural intuitive vision which is free from the imposition of limitation of any external factors.² Paramāṇus cannot be apprehended by the tactile-sense-organ nor can they be tasted by the sense-organ of taste nor can they be apprehended by the sense-organ of smell for want of magnitude and manifested touch, taste and smell respectively in them.³ But the sense-organs come into contact with ultimate atom⁴ for the Yogin. paramāṇus are stated to be the material cause of the universe⁵ and thus inapprehensible to the sense in both collective and individual forms⁶ and they are endowed with quiddity (antyaviśeṣa) by which one is discriminated from the others⁷ The numerical

Tena rasagandhasparśeṣu jñānam vyākhyātam,
VS. VI. 1. 9.

1. Mahatyanekadravyavattvāt rūpāccopalabdhīḥ, VS., 4. 1. 6;
Paramāṇormahattvābhāvādanupalabdhirityuktaṁ bhavati
Vyākhyā, Ibid;
Dhāraṇākaraṇopapatteśca, NS., II. 1. 36;
Senāvanavad-graṇamiti cennātIndriyatvādanūnām,
NS., II. 137.
2. Indriyajamapi dvividhaṁ sarvajñīyamasarvajñīyāṇca
sarvajñīyaṁ yogajadharmalakṣaṇayā pratyāsattyā tattat-
padārthasārthajñānaṁ, tathā hi paramāṇavaḥ...acintyapra-
bhāvo hi yogajadharmo na sahakāryāntaramapekṣate,
VSU., VIII. 1. 2; PPBh., p. 97;
NV., II. 1. 35, p. 230.
3. NVTP, VS. Fol. 26.
4. NV., IV. 1. 33.
5. Tatkāritatvādahetuḥ, NV. 1. 21.
6. Sā ceyamavayavajanyā na tvanusamhatimātraṁ, etc.,
NLV., p. 8. Prakāśa on NLV., p. 122.
7. Pṛthivyādīnām navānāmapi dravyatvayogaḥ svātmanyāram-
bhakatvaṁ guṇavattvaṁ kāryakāraṇāvirodhitvamantya-
viśeṣavattvaṁ, PPBha., p. 7.

differences of different kinds of ultimate atoms from one another and from all other things are remarkable and their differences from one another are of an ultimate nature. An ultimate atom is differentiated from all other ultimate atoms by its ultimate differentiating characteristic called particularity (viśeṣa). All ultimate atoms are regarded as discrete individuals, because each of them possesses its own particularity.¹ In Jaina Metaphysics also this attribute of an ultimate atom has been discussed in the same manner by the statement “paramāṇupoggale...siya āyā siya no āyā jāva no āyāi ya,... appaṇo aṭṭhe āyā, parassa āṭṭhe no āyā, tadubhayassa āṭṭhe avattavaṃ āyā i ya no āyā i ya.”²

This is to say, a paramāṇu has got self-existence or individuality from the point of view of existence and property of matter. It possesses its own independent nature different from that of another ultimate atom.

The Neo-Naiyāyikas headed by Raghunātha Śīromaṇi also hold the view that ultimate atoms and all eternal substances are distinguished from one another by themselves, for each of them is a unique particular by its very nature.³

In regard to the dimension of paramāṇu it is explained by the Nyāya-Vaiśeṣika Philosophy that a paramāṇu is endowed with the smallest and shortest dimension called pārimāṇḍalya (spherical)⁴ Jaina Metaphysics does not speak about the spherical dimension of paramāṇu, but it is clear from its statement that a paramāṇu occupies one space-point having a spherical point as its dimension, just as it is mentioned in the Nyāya-Vaiśeṣika.

1. PP. Bhā., pp. 321-22.

2. BhS., 12. 10. 469

3. Studies in Nyāya-Vaiśeṣika Metaphysics, p. 146;
see PTN., pp. 30-31.

4. Kaṇādarahasya, pp. 72-73; Nitye, nityaṃ VS., VII. 1. 19;
Nityaṃ parimāṇḍalyaṃ, Ibid., 20;
Pārimāṇḍalyamiti sarvāpaktṣaṃ parimāṇaṃ, NK., p. 318.

THE BUDDHIST VIEW ON NATURE OF PARAMĀṆU (ATOM)

According to the Buddhist Philosophy, the finest of all rūpas (matters) is rūpa-saṃghātaparamāṇu; it is intangible to the senses and soundless and it is aṣṭadravyaka.¹ When there exists Kāyendriya (tactile sense-organ) in it, then it is nava-dravyaka (having nine elements); when there is aparendriya (internal sense-organ) in it, then it is daśadravyaka (consisted of ten elements). Here paramāṇu does not mean dravyaparamāṇu which is one entity and one substance, but it is saṃghātaparamāṇu sarvasūkṣmarūpasamghāta (the finest material aggregate), for there is no finer material entity then this in rūpasamghāta (material aggregation),

Saṃghabhadra maintains the view that the finest part of sapratigha rūpas (impenetrable matters) whose further division is not possible is called paramāṇu, i.e. a paramāṇu cannot be divided into any part by other rūpa (matter) and citta (mind). It is called the finest of all forms of matter, for it has no part. On this ground the name 'sarvasūkṣma' has been attributed to it, as the finest is called kṣaṇa and it cannot be divided into half kṣaṇa (moment).² This nature of paramāṇu as conceived

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1. Kāme aṣṭadravyakośaśabdaḥ paramāṇuranindriyaḥ
Kāyendriyo navadravyo daśadravyoaparendriyaḥ
Abh. K., II. 22;
Saptadravyavinirbhāgī paramāṇurbahīrgatāḥ
Kāmeṣvekādhikaḥ kāye dvyadhikaścaksurādiṣu
Abh. D. 65. II, 100;
Paramāṇu (nu) saṃghātā (7) ityarthaḥ ta evāṣṭau
caksurvijñānadhātuvādayo (hitvā śeṣā daśa) saṃcitā
Abh. D., p. 25.
 2. D'après Saṃghabhadra (xxiii. 3. Folio 52a); Parmi les rūpas, susceptibles de resistance (sapratigha), la partie la plus subtile, qui n'est pas susceptible d'être scindée a nouveau, s'appelle paramāṇu, c'est à-dire le paramāṇu n'est pas

in the Buddhist Philosophy is similar to that of paramāṇu as explained by the Jaina, Nyāya-Vaiśeṣika and Yoga schools of thought. But it should be noted that the nature of Buddhist-Saṃghāta-paramāṇu opposes the indivisibility of atoms.¹

When in Kāmadhātu (external or physical world) sound is not generated in atom (śabdāyatana) and no indriya (sense) is produced, then this paramāṇu is aṣṭadravyaka (consisted of eight elements) as a rule, i. e. it is constituted of four particles of primary elements — earth, water, fire and air² and four particles of secondary elements, viz. colour, smell, taste and tangibility.³ When sound is not produced in paramāṇu, but it is generated by the action of other paramāṇus in kāyendriya (kāyāyatana),⁴ then one ninth substance (or entity) is produced i. e. when a sound-atom is produced by the action of other atoms, saṃghātaparamāṇu is ninefold. When sound is not

susceptible d'être devise en plusieurs par un autre rūpa, par la pensée. C'est qu'on dit être le plus petit rūpa; comme il n'a pas de parties, on lui donne nom le 'plus petit'. De même un kṣaṇa est nommé le plus petit temps et ne peut être devise en demikṣaṇas (iii. 86). LVPK II., p. 144, n. 3. Also cf "yat punarucyate rūpasamudāya iti niḥśarīraḥ paramāṇurveditavyaḥ, vuddhyāparyantaprabhedastu paramāṇuvavasthānaṃ piṇḍasaṃjñā vibhāvanatāmupādāya rūpe dravyāpariniṣpattipraveśatām copādāya, As., pp. 41. 2.

1. Abh. K., i. 43. Tibetan Text, p. 83

Vide The Central Conception of Buddhism, p. 13.

2. Abh. K., i. 12 C.

3. Abh. K., i. 10 A, 250 C. D; 65 A. B.

4. The combination of these aṇus which cannot be disintegrated is called saṃghātāṇu. In Kāmadhātu (external world) at least there is the co-production of eight substances and it has soundless intangible saṃghātāṇu. The substances (dravyas) are four Mahābhūtas and four upādāyarūpas (derivative matters), i. e. colour, taste, smell and touch; Abh. K. (A), p. 115.

generated in paramāṇu, but besides kāyendriya another indriya (cakṣurindriya, etc.) is produced, then there is produced one tenth substance (aparendriya) in it, i. e. cakṣurindriya, etc. are generated, because cakṣuśrotrādi-indriyas (eye, ear, etc.) are kāyendriyapratibaddhā (associated with tactile sense-organ) and pṛthakvartin āyatana (separate base). When the aforesaid saṃghātaparamāṇu is associated with sound, then nava-, daśa-, and ekādaśa-dravyakas (combined atoms having nine, ten and eleven elements of particles) are produced respectively. In fact, śabdāyatana (sound) which is generated from Mahābhūtas is indriyavinirbhāgī (indistinguishable or inseparable)¹. "Strictly speaking, even an eightfold molecule (saṃghātaparamāṇu) contains at least twenty atoms, since there are four sense-objects-atoms and each such derivative atom must have one atom of each of the four elements supporting it, making four derivative and sixteen elementary atoms in the simplest molecule (saṃghātaparamāṇu). This number is increased to five derivative and twenty elemental atoms in the case of those molecules containing sound atoms. The number eight or nine there refers only to the different kinds of atoms in a molecule, and not to the total number or constituent atoms."² But from the stand-point of the Sarvāstivādins³ there are fourteen kinds of atoms corresponding to the fourteen elements of Rūpa (Matter), one kind for each element, i. e. one given to each of the sense organs, and one to each of the sense-objects and four additional ones for each of the Mahābhūtas.⁴

1. In one śabdaparamāṇu which is produced by hands there are four Mahābhūtas, four upādāyarūpas, śabda (sound) and kāyendriya=10 dravyas; there are 11 dravyas in śabda produced by Jihvendriya (tongue). There is the increase of Jihvendriya in it; the atoms of Jihvendriya are in the atīndriya (insensible) Jihvā (tongue)., Abh. K. (H), p. 115; Saṃghabhadra, 10, p. 383, col. 3.
2. A Manual of Buddhist Philosophy, pp. 127-8.
3. Abh. Hr. 1, etc., Vide A Manual of Buddhist Philosophy, p. 127.
4. A Manual of Buddhist Philosophy, p. 127.

A LIGHT ON CARAMA (LAST) AND ACARAMA (NOT-LAST) CONDITION OF PARAMĀṆU (ATOM)

According to Jaina Philosophy, paramāṇu is acarama (not-last) from the aspect of substance, somehow carama (last) and somehow acarama (not-last) from those of locus or field, time and condition.¹ Paramāṇu which, being bereft of Vivakṣita-bhāva (intended condition) of transformation, will not attain that condition is carama with regard to that condition; paramāṇu opposite to carama is called acarama, i. e. paramāṇu which will attain that condition is carama with regard to that condition. Hence this paramāṇu is not carama but a acarama with regard to dravya (substance). For paramāṇu, which being lost from its own state, attains saṁghāta-paramāṇu (transformation of combination), and it will again attain paramāṇu-pariṇāma (transformation into ultimate atom) in course of time from the state of saṁghātapariṇāma, so it is acarama. With regard to kṣetra (field) paramāṇu is carama in some respect and acarama in other respect. In the space where a Kevalin (omniscient) attains samudghāta (expansion of soul), paramāṇu which is immersed there, does never attain immersion there as being particularized by the attainment of samudghāta of that Kevalin, because of the liberation of the Kevalin that paramāṇu cannot come there. So it is carama in this respect. But with regard to the remaining space (non-particularized space) it will remain in that kṣetra (field or locus), i. e. it is acarama because it exists there by immersion. With regard to kāla (time) paramāṇu is carama in some respect and acarama in other respect. In reference to kāla when samudghāta is performed by a Kevalin (omniscient), paramāṇu (ultimate atom) which existed, never exists at the (time) particularized by keva-

1. Davvādesenaṁ na carime acarime, khattādesenaṁ siya carime siya acarime, kālādesenaṁ siya carime siya acarime, bhāvādesenaṁ siya carime siya acarime,

Bhs., 14. 4. 512; Paṇṇavanā, 157.

lisamudghāta (expansion of soul by the Kevalin) because of the absence of samudghāta due to the attainment of liberation (siddhi) by the Kevalin. With regard to that it is cārama, while with regard to nirviśeṣakāla (non-particularized time) that paramāṇu is acārama. With regard to bhāva it is cārama in some respect and acārama in other respect, for paramāṇu which attained particular qualities like colour, etc., during the period of kevalisamudghāta, is cārama in respect of that intended kevalisamudghātaviśiṣṭavarnādipariṇāma (transformation of colour, etc. particularized by kevalisamudghāta), because of the liberation of the Kevalijñānin, again it does not attain that particular pariṇāma (transformation), while with regard to the remaining qualities, it is acārama.¹

Apradesa (partless) Condition of Paramāṇus (Atoms)

Paramāṇu is partless² with regard to dravya (substance) and also partless with regard to kṣetra (field or locus) invariably; it is partless in some respect and is having part in other respect with regard to kāla (time); it may be partless and it may have parts with regard to bhāva (condition)³ from the point of view of space-point.

A paramāṇu is partless from the aspect of kṣetra, i. e. it occupies one space-point. In its individual condition it occupies one-space point and it occupies this space-point by combining with other paramāṇu also, but it can exist there as being

1. BhS., 14. 4. 512 (Comm).
2. Paramāṇupoggale...añaddhe, amajjhe apaese, BhS., 5. 7. 215. Davvenam paramāṇu khittenegappasamogādhā kāleṇegasamaiā apaesā puggalā huṃti, Pudgalaṣaṭṭrimśikā, 2.
3. Savve poggalā sapadesāvi apadesāvi añantā khettādesenavi evaṃ ceva kālādesenavi bhāvādesenavi evaṃ ceva, je davvao appadesa se khettao niyama apadesa kālao siya sapadesa siya apadesa bhāvao siya sapadesa siya apadesa je khettao apadesa se davvao siya sapadesa siya apadesa, kālao bhāyanāe bhāvao bhayanāe, jāhā khettao evaṃ kālao bhāvao, BhS., 5. 8. 221.

combined with another adjacent paramāṇu existing in another space-point. A paramāṇu combined in a skandha (molecule) also occupies one space-point, but not more than one space-point.¹

Wherever there is one paramāṇu there are not unit of Dharmāstikāya (Principle of Motion), one unit of Adharmāstikāya (Principle of Rest) and one point of Ākāśa (space). There can take place an immersion of infinite units of Jīva (soul) and Pudgala (Matter) in one space-point. The immersion of kāla (time) may occur sometimes and may not occur sometimes there. If it takes place, it is an immersion of infinite addhāsamayas² (length of time).

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1. Jattha naṃ Bhaṃte ! ege poggalatthikāyapaese ogāḍhe .. evaṃ jahā jīvatthikāyapaese taheva niravasesaṃ, BhS., 13. 5. 484;
See SS., 5. 10 (comm); Pudgalaṣaṭṭrimśikā, 2.
 2. Jattha...ege dhammatthikāyapaese ogāḍhe tattha...ahammatthikāyapaesā .. ? ekko, āgāsatthikāya...? ekko jīvatthikāya ? aṇaṃtā, poggalatthikāyā...? aṇaṃtā, addhāsamayā...? siya ogāḍhā siya no ogāḍhā jai ogāḍhā aṇaṃtā, BhS., 13. 5. 483.

SECOND SECTION

PROPERTIES OF ATOM (PARAMĀṆU)

As to its property of colour there exists in it any one of the following five colours, viz. black, blue, red, yellow and white.¹ There cannot be more than one colour in a paramāṇu. This colour may be onefold up to infinitefold.² The colour of one paramāṇu can undergo transformation into the colour of another paramāṇu by combining with another paramāṇu or paramāṇus and vice versa, but its natural (intrinsic) colour is not destroyed. On the breaking up of the combination, a paramāṇu transforms itself into its own natural colour by dissociating from a skandha (molecule). There is no mixed colour in a paramāṇu.³

In regard to smell there exists in a paramāṇu any one of the following two smells, viz. pleasant and unpleasant.⁴ There cannot be both of them or a mixture of them in it. The capacity of smell can be onefold up to infinitefold⁵ in it. A paramāṇu having pleasant smell can transform into a paramāṇu having unpleasant smell by combination with another paramāṇu or paramāṇus and vice versa. On account of division by the breaking up of the combination a paramāṇu transforms itself

1. BhS., 20. 5. 668; 18. 6. 531.

2. Egaguṇakālagā naṁ Bhaṁte !...aṇaṁtaguṇakālagā, evaṁ avasesāvi vaṇṇagaṁdharasaphāsā neyāvā jāva aṇaṁtaguṇalukkhati, BhS., 25. 4. 740.

3. Yadā tu sa eva pudgalaskandhaḥ svaparamāṇuviyojanena aparaparamāṇusaṁyojanena vā dravyāntaratvamāpanno' api yāvatpūrvaparyāyān kṛṣṇatvādīna muñcati tāvad-bhāvasthānāyurityucyate, Paramāṇukhaṇḍaśaṣṭrīmśikā, p. 1; RV., 5. 25. 13, 14, pp. 491-2.

4. BhS., 20. 5. 668; 18. 6. 631; 25. 4. 740.

5. BhS., 25. 4. 740, Bhaṇṇai egaguṇāṇavi aṇaṁtabhāgammi jaṁ aṇaṁtaguṇā, Pudgalaśaṣṭrīmśikā, p. 2 (5)

into its own natural smell. There does not take place the destruction of the natural smell of a paramāṇu in the state of its combination with another paramāṇu or paramāṇus.¹

With regard to taste there exists in paramāṇu any one of the following five tastes, viz. bitter, sour, astringent, acidic and sweet.² But there cannot exist in it more than one taste. The capacity of taste can be onefold up to infinitefold.³ A paramāṇu, having assumed the form of aggregation by combining with another paramāṇu or paramāṇus can undergo transformation into the taste of another paramāṇu or of paramāṇus. But its natural taste is not destroyed. On its dissociation from a skandha a paramāṇu again transforms itself into its own natural taste. There is no mixed taste in it.⁴

As to the quality of touch there exist in a paramāṇu any two unopposing touch of four touches, viz. śīta-snigdha (cold-cohesive), śīta-rūkṣa (cold-dry), uṣṇa-snigdha (warm-cohesive) and uṣṇa-rūkṣa (warm-dry).⁵ Therefore, a paramāṇu may either be (1) cold-cohesive or (2) cold-dry or (3) warm-cohesive or (4) warm-dry. There is neither heavy nor light touches in it because it is agurulaghu (neither heavy nor light) and there is neither hardness nor softness in it, for these qualities are existent in a gross molecule. Its capacity of coldness, warmth, cohesiveness and dryness is onefold up to infinitefold.⁶

GROUP OF PARAMĀṆUS (ULTIMATE ATOM) ACCORDING TO THEIR QUALITIES

From the aspect of category (jāti) there are many groups of paramāṇus because of variousness of bhāva-guṇas (condi-

1. Paramāṇukhaṇḍaśaṭtriṃśikā, p. 1.

2. BhS., 20. 5. 668; 18. 6. 630.

3. BhS., 25. 4. 740; Pudgalaśaṭtriṃśikā, pp. 5-6.

4. Paramāṇukhaṇḍaśaṭtriṃśikā, pp. 1.4.

5. BhS., 20. 5. 668; RV., pp. 491-2.

6. BhS., 25. 4. 740; Pudgalaśaṭtriṃśikā, pp. 5, 6.

tion-qualities). There are two hundred basic groups of paramāṇus ($5 \times 5 \times 2 \times 8$) and there are infinitesimal infinite groups of paramāṇus according to the degrees of capacities of bhāvaguṇas (varṇa, gandha, rasa and sparśa=colour, smell, taste and touch).¹ As for example, one paramāṇu is black, pleasant-smelled, sweet, and warm and dry. The other paramāṇu is red, but the remaining qualities are like those of the first paramāṇu. It (first one) can become many paramāṇus having bhāvaguṇas (condition-qualities), i. e. atoms of qualities, they are of one basic group of paramāṇus. The second paramāṇu also, having bhāva-guṇas, can become many paramāṇus, hence these are paramāṇus of the second basic class. There become two hundred basic groups of paramāṇus by addition of the remaining basic groups of paramāṇus having their respective properties.

Next, the colour of the first paramāṇu is black and one-fold black, the other paramāṇu of this group is twofold black, some of this group is threefold black, some is fourfold black, thus innumerablefold black and some is infinitesimal fold black. In this way there can be infinite subgroups of paramāṇus according to the degree of onefold up to infinitesimal capacity of each bhāvaguṇa existing in each individual basic group of paramāṇu.²

CONTACT OF ATOMS

There are stated to be nine alternatives of sparśatā (contact or mere touch of paramāṇu), viz. (1) one part touched by one

1. Evaṁ ca sparśanādīnāmekaikasya ekadvitricatuh samkhyeyā asaṁkhyeyānantaguṇapariṇāmo avaseyaḥ,

RV., p. 485;

Anantabhedā api pudgalā aṇujātyā skandhajātyā ca dvai-vidhyamāpadyamānāḥ sarve gṛhyanta iti jātyādhārānantabhedasaṁsūcanārthaṁ bahuvacanaṁ kriyate, RV., p. 491.

2. BhS., 20. 5. 668; 25. 4. 740; Pudgalaśaṭṭriṁśikā, pp. 5, 6.

part, (2) more than one part touched by one part, (3) all parts touched by one part (4) one part touched by parts (more than one part), (5) parts touched by parts, (6) all parts touched by parts, (7) one part touched by all parts, (8) some parts touched by all parts and (9) all parts touched by all parts.¹

When one paramāṇu touches another one, the whole of it touches the whole of the other, for there cannot be the conception of point in point. A paramāṇu touches a skandha (molecule) having two units (pradeśas) by the alternatives—the part by the whole (parts) and the whole by the whole of it. It touches a skandha having three units by the alternatives—the part by the whole, the parts by the whole and the whole by the whole. By this order it touches also skandha (molecules) having four, five up to infinite units (pradeśas).²

In regard to the touching of the units of other substances like Dharmāstikāya, etc., it is explained that one paramāṇu touches the four points of Dharmāstikāya (Principle of Motion) in the minimum and seven points of it in the maximum.³ Similarly, it touches the four points of Adharmāstikāya

1. Paramāṇupoggale naṁ Bhaṁte ! paramāṇupoggalaṁ phusamāṇe kiṁ deseṇaṁ desaṁ phusai deseṇaṁ dese phusai 2 deseṇaṁ savvaṁ phusai 3 desehiṁ desaṁ phusai 4 desehiṁ dese phusai 5 desehiṁ savvaṁ phusai 6 savveṇaṁ desaṁ phusai 7 savveṇaṁ dese phusai 8 savveṇaṁ savvaṁ phusai 9, BhS., 5. 7. 216.
2. Evaṁ paramāṇupoggale dupadesiyaṁ phusamāṇe sattamaṇa-vamehiṁ phusai, paramāṇupoggale tipaesiyaṁ phusamāṇe nippacchimaehiṁ tihim phu jahā paramāṇupoggale tipaesiyaṁ phusāvio evaṁ phusāveyavvo jāva āṇamtapaesaio, BhS., 5. 7. 216.
3. Ege Bhaṁte poggalatthikāyapaese kevaiehiṁ dhammatthikāyapaesehiṁ ? evaṁ jaheva jivatthikāyassa, BhS., 13. 4. 482;
Ege ! Bhaṁte jivatthikāyapaese kevaiehiṁ dhammatthikāyapucchā jahannapae cauhiṁ ukkosapae sattahiṁ,
Evaṁ ahammatthikāyapaesihiṁ vi, BhS., 13. 4. 482.

(Principle of Rest) in the minimum and seven points of it in the maximum. That is to say, the point of space in which one ultimate atom exists is one and the same point of Dharmāstikāya and of Adharmāstikāya also. There can be six points of Dharmāstikāya on the six sides of a paramāṇu—east, west, north, south, up and down. Therefore, one paramāṇu can touch seven points of Dharmāstikāya at the maximum. But in the corner of Loka (universe) there can be the three points of Dharmāstikāya on the three sides of a paramāṇu. For this reason it is stated that one paramāṇu can touch the four points of Dharmāstikāya at the minimum. One paramāṇu touches the point of Dharmāstikāya immersed in one point of space with it (atom) by the rule of “the whole is touched by the whole.” The same explanation of this process of touch is to be understood in the case of Adharmāstikāya. But it is not comprehensible by this order of division whether a paramāṇu touches the parts of Dharmāstikāya or of Adharmāstikāya in six directions of its own sides. There is no intervening space between one space-point and another. For this reason the contact which takes place between two points existing in close proximity should be accepted in the case of paramāṇu with the unit of Dharmāstikāya existing in close proximity. It is futile to conceive of a part in a partless ultimate atom. A paramāṇu pudgala touches the seven points of Ākāśastikāya (space)¹ at the minimum and maximum respectively because Ākāśastikāya is everywhere (all-pervading).² It touches the infinite points of Jīvāstikāya (Soul), for the infinite points of Soul can immerse in one space-point.³ If a paramāṇu touches Addhāsamaya

1. Kevaiehiṃ āgāsatthikāya ! sattahiṃ kevaiehiṃ jīvattthikāya ? sesaṃ jahā dhammatthikāyassa aṇaṃtehiṃ kevaiehiṃ poggalatthikāyapaesehiṃ puttṭhe ? Goyamā ! aṇaṃtehiṃ, BhS., 13. 4. 482.
2. Āgāsatthikāyassa savvattha ukkosagaṃ bhāṇiyavvaṃ, Ibid.
3. Kevaiehiṃ jīvattthikāyapaesehiṃ puttṭhe Goyamā ! aṇaṃtehiṃ, Ibid.

(time), it touches infinite times¹ (addhāsamayas). These characteristics of paramāṇu show its extensiveness with the Universe and its all-pervasiveness.

VIBRATION AND MOTION OF ATOM

Pudgalagati (Motion of Matter) is defined as that which causes the motion of paramāṇupudgalas up to that of ananta-pradeśikaskandhas (molecules having infinite units of matter)². Paramāṇu is active and dynamic, but it is not always active or moving; sometimes it is active, sometimes it is non-active.³ Its activity is accidental.⁴ There are stated to be many kinds of movement of paramāṇu. It sometimes vibrates (revolves), sometimes makes various vibrations up to undergoes transformation.⁵ It is evidently clear by the Jaina Āgamic statement 'siya eyati siya veyati jāva pariṇamati' that besides vibration and various vibrations, a paramāṇu makes also other movements.

1. Kevaiehiṃ addhāsamaeahiṃ putṭhe siya putṭhe siya no putṭhe, jai putṭhe niyamaṃ aṇaṃtehiṃ. Ibid.
2. Se kiṃ taṃ poggalagati ? jaṃ ṇaṃ paramāṇupoggalāṇaṃ jāva aṇaṃtapaesiyāṇaṃ khaṃdhāṇaṃ gai pavattai, se taṃ poggalagai, Paṇṇavanā, 16. 474.
3. Paramāṇupoggale ṇaṃ Bhaṃte ! eyai veyai jāva taṃ taṃ bhāvaṃ pariṇamai ? Goyamā ! siya eyai veyai jāva pariṇamai siya no eyai jāva no pariṇamai, BhS., 5. 7. 213; Navaraṃ ṣaṣṭham, tatra ṣaṣṭho deśayoḥ ejaṇaṃ, pradeśayo-
reva vā anejanamiti, BhS., 5. 7. 213 (comm);
Paramāṇu...ityādi siya eyati tti kadācit ejate, kadācitkatvāt sarvapudgaleṣu ejanādiharmāṇāṃ, dvipradeśika trayo vikalpaḥ (1) syād ejaṇaṃ, (2) syād anejaṇaṃ, etc. (comm).
4. Ibid. It shows that the motion of an ultimate atom is relative, it is sometimes stable and sometimes unstable like the nuclei of the physical sciences.
5. BhS., 5. 7. 213.

That is to say, paramāṇus are always in a state of flux by their vibrating (revolving), moving, combining with one another to transform themselves into skandhas. Hence it is explained that a paramāṇu may or may not vibrate and transform itself into a state of vibration.¹

A paramāṇu can make deśāntaragāmīkriyā (activity or movement of going to another place) from one space-point to another one. While making vibrating movement, it can make also deśāntaragāmī movement. The motion can take place together with other movements like vibration,² etc. Here the question arises how does a paramāṇu existing in one space point make vibration. In the usual sense the meaning of the word 'eyai' is vibration, but it is not desirable here, for in that case there takes place the movement of a paramāṇu from one space-point beyond it. Therefore, a paramāṇu existing in one space-point can only make a revolving movement, but the revolution should be without any axis, because there cannot be the conception of an axis is a paramāṇu. It is itself axis.

The movements of a paramāṇu such as, vibration, etc., can be samita (regular) and aniyamita (irregular) also, i. e. certain and uncertain. Here niyamitā (regularity) or aniyamitā (irregularity) of the movement of a paramāṇu is conditional upon space-time.³

In a paramāṇu activity or motion can be natural (spontaneous) or it can be made by the combination of other paramāṇu or skandha. The activity and motion which take place in Matter due to the instrumentality of Jīva (Soul or being) are called applied (prāyogika) activity and motion. But there cannot occur any activity and motion in a paramāṇu by the instrumentality of Jīva (soul) because a paramāṇu cannot be

1. BhS., 5. 7. 213.

2. BhS., (comm)., 3. 3. 153.

3. Eṣāṁ ca ejanādibhāvānāṁ kramabhāvitvena sāmānyataḥ sadeti mantavyaṁ na tu pratyekāpekṣayā kramabhāvināṁ yugapadabhāvāditi, BhS., (comm)., 3. 3. 153.

received by Jiva and there is no capacity in Jiva to bring about a transformation in Pudgala without receiving it.¹ Therefore, the activity and motion which take place in a paramāṇu are natural.

SPEED OF MOTION OF PARAMĀṆU

It is stated in the Jaina Āgamas about the *deśāntaragāminī-kriyā*=*yānī-gatikriyā* (movement) that a paramāṇu can go from the eastern last border of the Universe to the western last border, from the western last border to the eastern last border, from the northern last border to the southern last border, from the southern last border to the northern last border, from the upward last border to the downward last border and vice versa in one samaya (instant) by its maximum speed of motion.² Its minimum speed of motion is determined

1. BhS., 16. 8. 585;

In Aloka there is the non-existence of matter and media of motion and rest, hence soul cannot make movement there, BhS., 3. 2. 147; 5. 8. 221; 6. 3. 244;

Jivāṇaṃ kammovacaē...payogaṣā jivāṇaṃ tivahe pagoe paṇṇatte, taṇṇahā-maṇappaoge, vai. kā icceṇaṃ tivihenaṃ paogeṇaṃ jivāṇaṃ kammovacaē payogaṣā no vīsaṣā, BhS., 6. 3. 234;

Deve ṇaṃ Bhaṃte ! mahiddhie jāva mahānubhāge bahirae poggale apariyāitte pabhu egavaṇṇaṃ egarūvaṃ viuvvittae, Goyamā ! no tiṇaṭṭhe, BhS., 6. 9. 253;

Deve ṇaṃ Bhaṃte ! mahiddhie jāva mahesakkhe bāhirae poggale apariyāittā pabhu tiriyaṇavvayaṃ vā tiriyaḥhittim vā ullamghettae vā pallaṃghettae vā ? Goyamā ! no iṇaṭṭhe samattṭhe, Ibid., 14. 5. 517;

Jivadavvāṇaṃ ajivadavvā paribhogattāe havvamāgacchamti, Ibid., 25. 2. 72.

2. *Paramāṇupoggale ṇaṃ Bhaṃte ! logassa puracchimillāo carimaṇṭāo paccacchimillaṃ carimaṇṭaṃ jāva uvarillaṃ carimaṇṭaṃ gacchai,* BhS., 16. 8. 584; *Paṇṇa.,* 16. 471.

by its going from one space-point to another adjacent space-point by slow movement¹ in one samaya (instant). That means samaya is divisible. Here is a defect in the conception of the last unit of kāla (time) as conceived in Jaina Philosophy.

The motion of paramāṇupudgala takes place in a straight line. In one unit of Kāla its motion, whether from one space-point to another one or from one last border of the Universe to another one, is to occur in a straight line.² If it is curvilinear motion, then it will take more than one samaya. Vighraḡagati (curvilinear motion) occurs due to the action of others.³

SPRṢṬAGATI (MOTION) OF ATOM BY TOUCHING OTHER MATTERS

When a paramāṇu (ultimate atom) makes a movement by touching skandhas (aggregates) having from two up to infinite units of matter, it is called sprṣṭa-or sparsāgati.⁴

When the division of a skandha takes place, then a motion is the splitted up pieces of matter is produced. But there can be motion also in the unbroken or unsplitted up pieces of matter due to ten causes, viz. motion while collecting, transforming, breathing in, breathing out, feeling, dissociating (karmic matter), assuming transformable body, enjoying sexual pleasure, being overpowered or overtaken by Yakṣa (ghost or spirit) and being carried by air.⁵ There takes place a motion

1. Pravacanasāra, Vṛtti, II. 46.

2. BhS., 16. 8. 584; TS. Bhā., 2. 27.

3. Ibid.

4. Phusamāṇagai jannaṁ paramāṇupoggale dupaesiya jāva aṇaṁtapaesiyāṇaṁ khaṁdhāṇaṁ aṇṇamaṇṇaṁ .phusittā naṁ gai pavattai...settam phusamāṇagai, Paṇṇa., 16. 474.

5. Dasahiṁ ṭhāṇehiṁ acchiṇṇe puggale calejjā, taṁjahā-āhā-rijjamāṇe vā calejjā, pariṇāmejjamāṇe vā calejjā, ussasijjamāṇe vā calejjā, nissasijjamāṇe vā calejjā, vedejjamāṇe vā

in Matter, because of there being the division of breaking up of skandha. When a paramāṇu dissociates from one skandha it does so by a terrible motion. On the disintegration of a skandha a dynamic motion is naturally generated, but in acchinna pudgala-skandha (unbroken aggregate of matter) also there takes place a dynamic motion due to the above mentioned ten causes.

Activity and motion of paramāṇu are regular from some point of view and irregular also from other points of view. But they are mainly irregular, for this reason the motion of it is called aniyata (irregular).¹

Paramāṇus are vibrating (or moving) and non-vibrating (or non-moving) from the point of view of time.² The duration of vibration (or movement) of a paramāṇu is one samaya (instant) in the minimum and innumerableth part of an āvalikā in the maximum and that of its non-moving is one samaya in the minimum and innumerable samayas in the maximum.³ A paramāṇu is sarvajña and nireja (wholly moving and non-moving), while skandhas (aggregates) having two up to infinite units may be deśajña (partially moving), sarvajña (wholly moving) and nireja (non-moving).⁴

In regard to the intermediate times of the vibration of matters—ultimate atoms and aggregates, it is stated that matter immersed in one space-point or innumerable points of space exist vibrating for one samaya in the minimum and innumerableth part of an āvalikā in the maximum in the case

calejjā, nijjarījjamāṇe vā calejjā, viuvvijjamāṇe vā calejjā, pariārījjamāṇe vā calejjā, jakkhaitṭhe vā calejjā, vāyapariggāhe vā calejjā, Sthānā., 10. 9. 35.

1. RV., 2. 26; Paramāṇorgatiḥ aniyata, vide Jaina Padārtha Vijñānāmen Pudgala, p. 72.

1, BhS., 25. 4. 744;

2. Ibid., 5. 7. 217.

4. Ibid., 25. 4. 744

of vibration and innumerable samayas in the case of non-vibration from the points of view of time, etc.¹

As to the rules of irregular and regular activity and motion of paramāṇu the following points emerge out of the discussion on the activity and motion of it : (1) it is uncertain when an non-active ultimate atom will commence its activity and motion. They may start at any time between one samaya (instant) and countless samayas (instants). But after the passing away of countless samayas it will definitely commence its activity and motion. (2) It is not possible to say when an active ultimate atom will stop its activity and motion. It can stop them at any time between one samaya and the innumerable part of an āvalikā. But after an innumerable part of an āvalikā it will definitely stop its activity and motion. (3) It is uncertain to presume what direction will be taken by a paramāṇu in its deśāntaragati (cross space-point-movement). On the commencement of its motion spontaneously, it may make movement in any direction. But it is not yet determined which direction will be taken by it in its movement, if it is made by the action of other pieces of matter. (4) Besides, it cannot be said what kind of motion and activity it will make on their commencement. It is uncertain whether it will revolve or vibrate and move simultaneously on its course to reach another place. (5) It is not possible to say what speed—slow or fast, will be taken by a paramāṇu in its commencement of its motion and activity. It is uncertain whether it will take the speed of motion of traversing one space-point in one samaya (instant) or the speed of motion for reaching the last border Loka (Universe) in a samaya (instant) or any intermediate speed of motion between them.

But the following rules of regular motion of a paramāṇu can be outlined in this way : (1) The deśāntaragati (movement from one place to another) of a paramāṇu will take place in a straight line. (2) In the case of its curvilinear motion an

1. BhS., 5. 7. 217.

application of another matter is necessary. (3) Soul cannot be the direct cause in its movement. (4) The minimum speed of motion of a paramāṇu is the traversing of a distance of one space-point in one samaya, while the maximum speed of its motion is determined by its movement from one last border of the Universe to another last border in one samaya. (5) The motion and activity of a paramāṇu take place spontaneously and they can be effected by the application of other matters.

PRATIGHĀTA OF PUDGALA (RESISTANCE OF MATTER)

There are stated to be three kinds of pudgalapratighāta (resistance of matter), viz. (1) resistance obtained by one paramāṇu of skandha (molecule) when it is resisted by another paramāṇu on the way of its motion, (2) resistance obtained by a paramāṇu due to its property of dryness (repulsive force) and (3) resistance obtained by a paramāṇu at the last border of the Universe because of the non-existence of Dharmāstikāya (Principle of Motion) in the Non-Universe.¹ In other words, the resistance obtained by an ultimate atom is possible under three conditions : (1) If there takes place the physical contact of an ultimate atom with another one, while making their motion in great speed by the process of natural transformation, then the first paramāṇu is resisted in itself and can resist the other paramāṇu with which it comes into contact. (2) Having combined with other paramāṇu or skandha by virtue of its property of cohesiveness and dryness, a paramāṇu loses its individuality (or discreteness) for a certain period of time. (3) It is resisted in its motion at the last border of the Universe because of the absence of Dharmāstikāya (Principle of Motion)

1. Tivihe poggalapadighāte, pa taṃ paramāṇupoggale paramāṇupoggalaṃ pappā paḍihaṇijjā, lukkhattāe vā paḍihaṇijjā, logaṃte vā paḍihaṇijjā, Sthānāṅga, 3. 211, 3. 4. 211.

in Aloka (Non-Universe). Thus according to three kinds of resistance, three names have been attributed to the resistance obtained by a paramāṇu, viz. vegapratighāta, bandhapariṇāma-pratighāta and upakārābhavapratighāta.¹

A paramāṇu is resisted by another one on the way of its motion because of their respective properties of impassability or impenetrability, when they come into contact with each other in their motion. A paramāṇu bound by combination with another one or other paramāṇus exists collectively with other paramāṇus in a skandha (aggregate). In this way it is resisted by its own individual condition. This resistance of a paramāṇu is the cause of the perceptible multifariousness of the Universe. According to the physical sciences also, these interactions give rise to "the existence and behaviour of matter in bulk."² In the movement of an ultimate atom Dharmāstikāya (Principle of Motion) is assistant on account of its support in the motion, so it is to take the support of Dharmāstikāya in its activity and motion. It cannot make any activity and motion without this support in spite of its having the capacity of making motion and activity.

Dharmāstikāya is co-extensive with the space of the Universe, but it does not exist in the Non-Universe. A paramāṇu cannot go there because of being inactive and immobile in the absence of Dharmāstikāya. Therefore, it is resisted and stopped at the last border of the Universe, when it reaches there by making motion in great speed in one samaya.

The following rules of Pratighātatva and Apratighātatva (resistance and non-resistance) emerge out of the discussion on the speed and resistance of paramāṇu. If any moving ultimate atom does not meet another moving ultimate atom in its way of motion with any speed, then it cannot be resisted. In this

1. Yatastrividhaṁ pratighātamāmananti bhagavantaḥ, paramāṇūnām bandhapariṇāmopakārābhāvavegākhyam,

TS., p. 368.

2. Atoms and the Universe, p. 126.

way the occurrence of mutually opposing conditions resisting and non-resisting (*pratighātin* and *apratighātin*) in an ultimate atom has been accepted in Jaina Metaphysics. In the physical sciences also the existence of such mutually opposing conditions—resisting and non-resisting, in matter is explained by demonstration. As for instance, X-Ray is non-resisting in comparison with any gross matter of different kinds; it does not stop on its way, but it is resisted by the thick covering of glass.

APRATIGHĀTA (NON-RESISTANCE) OF ATOM

A *paramāṇu* (ultimate atom) is non-resisting in its motion; nothing can resist, obstruct and stop it in its motion in the Universe except the above mentioned three conditions. Hence it is not resisted in its movement to another place; it is capable to exist together there where many other ultimate atoms exist; it is capable to make activity independently of those of others; it is able to move from there without any resistance, while existing together with other ultimate atoms. As these four natures exist in an ultimate atom, so it is non-resisting. A moving ultimate atom cannot be resisted by any other matter, any being and any other substance in this way. It goes off from the midst of all by making movement. It accommodates itself in the space-point in which other matters or soul or other substances exist, having gone there. It can make activities like revolution, vibration, etc., by its independent state, while accommodating itself with others. An ultimate atom is non-resisting in itself and non-resisting also to another material substances from this view-point, i. e. it does not resist others. Thus it is fully independent in this respect.

THE NYĀYA-VAIŚEṢIKA VIEW ON MOTION OF PARAMĀṆU (ATOM)

According to the Nyāya-Vaiśeṣika, there is supposed to be two kinds of motion of free atoms, viz. creative motion and

non-creative motion. The creative motion produces conjunction of ultimate atoms, which leads to the formation of gross bodies and eventually of the material universe. This motion is generated in ultimate atoms only on the eve of a new cosmic creation after the period of cosmic rest (pralaya).¹ The non-creative motion is not productive of conjunction or disjunction of ultimate atoms. It simply separates ultimate atoms from the space-points occupied by them and join (i. e. combine) them with the contiguous point of space. It may occasionally cause a kind of placing of atoms side by side or loose grouping of atoms, but it never conjoins them to be actually integrated nor to be composite bodies.²

No impact upon the process of creation is made by this motion; it is possible for atoms only during the period of cosmic rest. It is supplanted by the creative motion of the emergence of the necessity for creation. The only object of non-creative motion is to determine the duration of cosmic rest in terms of kṣaṇa resolved by each unit of such motion.³

There is no spontaneous motion of free atoms in these two cases, for Adrṣṭa (unseen force) is supposed to be the cause of creative motion. It leads the destiny of souls in accordance with their karmas and demands to be furnished with properly equipped bodies and suitable material world for the experience of pleasure and pain. Under the operation of this force atoms begin to move in order to combine into countless varieties of objects. The non-creative motion is produced in this way, when a body is dissolved by a violent shaking or impact, the effect of which sets the atoms of the dissolved body in motion. The motion generates in atoms in turn the property of impulse (vega) which keep them going, i. e. vibrating (span-dana) continually during the whole period of cosmic rest.⁴

1. Studies in Nyāya-Vaiśeṣika Metaphysics, p. 146.

2. Ibid., p. 147; see NKuB., p. 91.

3. Ibid., see NKu, Pt. 1, p. 333.

4. NKuB., p. 91, vide Studies in Nyāya-Vaiśeṣika Metaphysics, p. 147.

The fundamental difference between the Jaina and Nyāya Vaiśeṣika systems of thought in regard to the motion of atom is this that the former maintains that the motion is the intrinsic capacity in an ultimate atom, while the latter holds the view that the motion is not inherent in an ultimate atom but it is caused by *Adṛṣṭa* (unseen force) in the case of creative motion and it is generated by the effect of violent shaking of a body or impact in the case of non-creative motion. The Jaina view on oscillation and motion of *paramāṇu* (ultimate atom) is nearer to the atomic motion of the physical sciences.

As for example, "From X-Ray studies it is known that in crystalline solids the atoms are located at definite points in a lattice arrangement. The atoms vibrate about these lattice points, the amplitude of the vibration increasing with the rise in temperature. At the melting point, which occurs at a fixed temperature different for each crystalline substance, the amplitudes of the vibrations have become as large as to disturb the orderly arrangement of the atoms."¹

"The concept of oscillatory behaviour, or wave motion is a basic one which finds wide application in atomic physics."²
 "The wave aspect of elementary particles is possible their most fundamental characteristic, and it is not possible to reduce this concept further by forming any adequate picture of what substance, if any, is undergoing pulsation."³

"The motion of atom of the physical sciences is demonstrated by the breaking up of atom, its smashing by the energy within itself and the emission of energy from it and the radiations from the radio active elements which consist of three distinct types— α -, β —and γ —rays. Radio active substances emit spontaneously either helium nuclei or electrons. These take place the radio active transformation in them. "When a nucleus is transformed into another, either by α —or β —decay, some

1. Physics, p. 261.

2. Atomic Physics, p. 12, 1. 4.

3. Ibid.

energy is released in the process, which is taken up as the energy of motion of the α —or the β —particle with surplus appearing as γ —rays. The energy released from the nucleus may be quite high of the order of millions of electron-volts.”¹

As to *vega-pratighāta* of *paramāṇu* conceived in Jaina Philosophy it can be said that the physical sciences contain a parallel view in regard to the collision of atomic particles. “In any elastic collision, say between two billiards balls, the total energy and the total momentum before and after the collision must be the same. If one ball makes a head-on collision with another at rest, the first will come to a stop and the second will carry on in the forward direction with the energy and momentum previously had by the first particles. In off-centre collisions both balls will be set into motion at right angles to each other, and the direction and energy of each of the balls can be simply calculated from the conservation of laws. Similarly, if atomic particle collides with a helium nucleus, both are set in motion at right angles to each other. We can often observe the path of both particles after collision in a cloud chamber and verify that the laws of conservation of energy and momentum hold for nucleus processes.”² “Neutrons themselves are last detected by making them collide with protons, i. e. by letting the neutron beam pass through a hydrogenous medium, say water or paraffin wax. Since the neutron and the proton have approximately the same mass, their collision is analogous to that between two billiards balls. In a head-on collision the neutron is brought to rest and the proton is emitted in the forward direction with the whole energy. In off-centre collisions the proton may be emitted at different angles but from the angle of emission and from the energy of the proton the energy of the neutron can be deduced.”³

In regard to *Bandha-pariṇāma-pratighāta* of *paramāṇu* a

1. Atomic Physics, p. 65.
2. Atoms and the Universe, p. 84.
3. Ibid., p. 87.

similar theory is found in the physical sciences, "Every atom exerts a force upon every other atom. The details and the magnitude of the force vary as between one type of atom and another, but in general the force is always a force of attraction when the atoms are at a distance apart greater than their normal diameters, changing to a force of repulsion if the atoms are forced very close together. Thus there will be a tendency for atoms because of their force of attraction to draw together and stick."¹

The Jaina view of upakārābhāva-pratighāta of paramāṇu compares well with the view of modern science that beyond the borders of the finite universe even the light rays do not travel, as nothing lies beyond, probably nothing manifested; "light rays, apparently going in a circle, returning boomerang-like to their point of departure."² That is to say, they are resisted or checked like paramāṇus of Jaina philosophy at the last border of Loka (Universe) because of the absence of the support of motion.



1. Atoms and the Universe, p. 126.

2. Mystries of Space, p. 5.

TRANSFORMATION OF MATTER (PUDGALA-PARIṆĀMA)

Matter (Pudgala) undergoes transformation ; there takes place the external and internal transformations in its attributes. The change in the character of the qualities of a substance is pariṇāma (transformation)¹ which is brought about by the applied process or the natural process without giving up its own class or nature.² Generally an attainment of another state by giving up one state is called pariṇāma. No substance is absolutely permanent by any means nor is it destroyable by all means, for this reason, it is proper to admit pariṇāma of each substance.³ From this point of view it is beginningless and is having a beginning also.⁴ As for instance, pariṇāma of Matter is ādimat (having a beginning);⁵ an ultimate atom undergoes two kinds of pariṇāma, viz. gatipariṇāma (transformation of motion) and guṇapariṇāma (transformation of quality). An ultimate atom having equal guṇa will transform another ultimate atom having equal but dissimilar guṇa because of its combination with another ultimate atom or molecule. An ultimate atom having higher degrees of guṇas (qualities)

1. Pariṇāmo avasthāntaragamanam na ca sarvathā hyavasthānam, na ca sarvathā vināśaḥ pariṇāmastadvidābhiṣṭaḥ vide Syādvādmañjarī, p. 205.
2. Dravyasya svajātyaparitṛyāgena prayogavistrasālakṣaṇo vikāraḥ pariṇāmaḥ RV., 5. 22. 10.
3. Pariṇāmo avasthāntaragamanam na ca sarvathā hyavasthānam na ca sarvathā vināśaḥ pariṇāmastadvidābhiṣṭaḥ, Syādvādmañjarī, p. 205.
4. Anādirādīmāṁśca, TS., ch. V. 43.
5. Rūpiṣvādimān, TS., ch. V. 43.

will transform an ultimate atom having lower ones.¹ It is explained in the *Tattvārthādhigama Sūtra* that some skandha (molecule) is formed by the process of combination of ultimate atoms, some by that of dissociation of molecules and some by both the processes of combination and dissociation of ultimate atoms² or molecules. When one binary molecule is formed by combination of two discrete ultimate atoms, then it is called *dvipradeśika skandha* produced by combination of two ultimate atoms. Similarly, *tripradeśika skandha* (molecule having three units of matter), *catuspradeśika skandha* (molecule having four units of matter), *saṃkhyātapradeśika skandha* (molecule having countable units), *asaṃkhyātapradeśika skandha* (molecule having countless units), *anantapradeśikaskandha* (molecule having infinite units) up to *anantānantapradeśikaskandha* (molecule having infinitefold infinite units) are formed by combination of three, four, countable, countless, infinite and infinitefold-infinite ultimate atoms,³ respectively.

The smaller and smaller skandhas which are formed by the process of disintegration of larger skandhas can be found as *anantānantapradeśikaskandha* up to *dvipradeśikaskandha*⁴ (molecule having two units)

When, on the disintegration of any skandha a new skandha is formed by the process of combination of some other material substance with the part of that skandha at the very moment, then that skandha is stated to be formed by the joint process of

1. *Bandhe samādhikau pariṇāmikau*, TS., ch. V. 36.
2. *Saṅghātādbhedāt saṅghātabhedāditebhyastribhyaḥ kāraṇebhyaḥ skandhā utpadyante dvipradeśādyah*, TS., Bhā., 5. 26, p. 366.
3. *Tadyathā-dvayoḥ paramāṇvoḥ saṅghātāt dvipradeśaḥ, dvipradeśasyāṇośca saṅghātāttripradeśaḥ, egaṃ saṃkhyeyānāmasaṃkhyeyānām ca pradeśānām saṅghātāt tāvatpradeśaḥ*, TS., Bhā., p. 367.
4. *Eṣāmeva bhedaḍ-dvipradeśaparyantāḥ*. TS. Bhā., 5. 26, p. 370.

combination and dissociation of parts of skandha. Such skandhas also can be dvipradeśikaskandha up to anantānantapradeśikaskandha.¹ It should be understood for skandhas having more than two units that skandhas having three units, four units, etc., are formed by combination of three, four, etc.—discrete ultimate atoms also. And tripradeśikaskandha can be produced by combination of an ultimate atom with dvipradeśikaskandha and catuṣpradeśikaskandha by combination of two or one ultimate atom with dvipradeśika or tripradeśikaskandha respectively by the gradual order.²

An ultimate atom is not an effect of any material substance, for this reason the combination of material substance is not possible in its origination. It has been accepted as eternal; nevertheless, here its origination which is spoken of in the sūtra, “Bhedādanuḥ” is explained from the point of view of paryāya (mode), i. e. an ultimate atom is eternal as substance, but it is also producible (janya) from the modal point of view. The states of its existence sometimes as a constituent element of a skandha and sometimes as a discrete atom, because of being dissociated from a skandha are its paryāyas (modes or particular conditions). The discrete state of it (viśakalita avasthā) originates by disintegration of a skandha for this reason, here the purport of the statement “origination of ultimate atom by a process of disintegration” is this much that an ultimate atom having the discrete state is an effect of the disintegration of a skandha, but not a pure ultimate atom.³

It is further explained that imperceptible skandhas having

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1. Eta eva ca saṅghātabhedābhyāmekasāmayikābhyāṁ dvipradeśādayaḥ skandhā utpadyante, anyasaṅghātenānyato bhedeneti, Ibid.
 2. TS., p. 370.
 3. Bhedādeva paramāṇurutpadyate, na saṅghātāditi,
TS. Bhā., p. 371;
see also the Commentary of Siddhasena Gaṇin, TS., p. 371.

an efficient cause can be perceptible.¹ There are different kinds of transformation of Matter; therefore some skandha is inapprehensible to the sense of vision, while some is apprehensible to the sense of vision. A skandha which is imperceptible because of being fine, can be perceptible by its gross transformation, having given up the state of its fineness or fine transformation.

In such a formation of that skandha both the causes—disintegration and integration are conditions. When on the cessation of sūkṣmatvapariṇāma transformation of fineness in any skandha there originates sthūlatva-pariṇāma (transformation of grossness) then some new ultimate atoms must necessarily combine with that skandha, but some ultimate atoms dissociate also from it. On the cessation of sūkṣmatvapariṇāma an origination of sthūlatva-pariṇāma takes place not merely by combination of combined ultimate atoms or only by dissociation of dissociated ultimate atoms. Without sthūlatvapariṇāma no skandha can become perceptible. For this reason, here as a rule it is said that a perceptible molecule is formed by both the process of disintegration and integration.²

1. Bhedasaṅghātābhyām cākṣuṣāḥ, TS., 5. 28, p. 372; Bhedasaṅghātābhyām cākṣuṣāḥ skandhāḥ utpadyante acākṣuṣāstu yathoktāt saṅghātād-bhedāt saṅghātabhedācceti, TS. Bhā., 5. 28, p. 372.
2. Svata eva pariṇativīśeṣāccākṣuṣatvapariṇāmabhājo bādarāḥ skandhāḥ saṅghātabhedābhyām utpadyante ityetanniya-mayate apare varṇayanti saṅghātādeva skandhānāmātmalā-bhāsiddherbhedasaṅghātagrahaṇamanarthakam, naitadevaṁ tadviśeṣajñāpanārthatvāt, na sarva eva saṅghātaścākṣuṣā grāhyaḥ, yato anantānantānusamhatiniṣpādyo' api skandho bādarapariṇatimānevanayanādigocaratām pratipadyate, na śeṣa iti evaṁ ca vyācakṣāṇānām bhedagrahaṇamanarthakameva syāt taccāyuktam, yataḥ sūkṣmapariṇāmo paratau sthāulyapariṇāmaḥ, tatra ca yathā samhanyate paramāṇavasthā bhidyante api kecanetyataḥ saṅghātabhedābhyāmeva cākṣuṣā niṣpadyante na saṅghātādeveti, TS., p. 372.

Two meaning of the word 'Bheda' are implied : (1) disintegration of skandha, i. e. a dissociation of ultimate atoms from it and (2) on the cessation of the previous transformation an origination of another transformation. The purport of the above sūtra¹ has been taken up by accepting the first one between them. According to the second meaning, when any fine molecule attains a gross transformation capable to be apprehended by the sense of sight, i. e. on the cessation of imperceptibility, it becomes apprehensible to the sense of sight,² then a gross transformation (bādarapariṇāma) is a condition in its becoming as such, which is conditional upon the combination of particular number of infinite discrete ultimate atoms (saṁghāta). Not only the new gross transformation on the cessation of the former transformation-like fineness is the cause of its becoming perceptible nor only particular infinite number of ultimate atoms is the cause of its becoming perceptible, but both the transformation and the said number-like combination are the causes of its becoming perceptible. Although the meaning of the word 'Cākṣuṣā' of the aphorism "Bhedasaṁghātābhyāṁ cākṣuṣāḥ", denoting a skandha apprehended by the eye, appears to be correct; nevertheless, here the characteristic meaning of all the sense-organs are implied by the word 'cākṣuṣā'. According to this interpretation, the meaning of the sūtra is that dissociation and combination—the two causes are the conditions in the becoming of all intangible skandhas to be tangible to the senses. On account of there being unlimited varieties of material transformation, as the previously intangible skandha can be later tangible to the senses due to the causes like disintegration and integration, so a gross skandha also becomes fine. Not only this much, for a skandha apprehended by more senses becomes apprehensible to a few senses due to the

1. Bhedasaṁghātābhyāṁ cākṣuṣāḥ, TS. V. 28.

2. Ubhābhyāṁ bhedasaṁghātābhyāmekakālābhyāṁ cākṣuṣā bhavanti, cakṣurgrahaṇācca samastendriyaparigrahaḥ, TS., p. 373.

varieties of transformation, e. g. the things like salt, resinous substance, etc., can be apprehended by the four senses, viz. the senses of sight, of touch, of taste and of smell, but they can also be apprehended by only the senses of taste and smell because of its being diluted into water.¹

As to the point of the cause of the origination of intangible skandha (molecule) it is explained that the three causes of the origination of skandha have been discussed in general way in the twenty-sixth aphorism "Saṅghātabhedebhya utpadyante"—here only the particular discussion is made on the causes of becoming of particular skandha or of the origination of a perceptible skandha from its imperceptible state. For this reason, according to that general rule, the causes of the origination of acākṣuṣa skandha (imperceptible molecule) are only three, viz. bheda, saṅghāta and bhedasaṅghāta (disintegration, integration and disintegration-integration).

KINDS OF PUDGALAPARIṆĀMA (TRANSFORMATION OF MATTER)

There are mainly ten kinds of paramāṇus² taking place in Matter, viz. varṇapariṇāma (transformation of

1. Ta eva bādarāsta eva ca punaḥ sūkṣmā iti, yato vicitrapariṇāmāḥ pudgalāḥ kadācid-bādarapariṇāmamanubhūya jala-dharasātakratucāpasaudāminilavaṇasakalādikamatha paścādalakṣaṇīyapariṇāmamātmasvarūpāvasthānasvabhāvamatīsūkṣmamādadate karaṇāntaragrahaṇalakṣaṇatām vā bhajante lavaṇahīṅuprabhṛtayaḥ sūcanīyapariṇāmaśca jantivā punarapī viyati paritaḥ sakaladigantarāvarodhivāridharasvādinā sthūlenākāreṇa pariṇamante, TS., p. 373.
2. Pañcavihe poggalapariṇāme pañṇatte taṃjahā vaṇṇapariṇāme gaṃdhapariṇāme rasapariṇāme phāsapariṇāme and saṃsthāṇa pariṇāme, BhS., 8. 10. 355;
Ajīvapariṇāme...dasavihe pañṇatte taṃjahā - baṃdhapari-

colour), gandhapariṇāma (transformation of smell), rasapariṇāma (transformation of taste), sparśapariṇāma (transformation of touch), saṁsthānapariṇāma (transformation of shape), bandhanapariṇāma (transformation of binding or combination), gatipariṇāma (transformation of motion), bhedapariṇāma (transformation of division), agurulaghuguṇapariṇāma (transformation of neither heaviness nor lightness) and śabdapariṇāma (transformation of sound).

The transformation of colour, smell, taste and touch¹ takes place in all forms of matter as a result of integration and disintegration of forms of Matter by the applied, natural and applied-cum-natural processes. These ten kinds of pariṇāma of Pudgala are divided into the following kinds on the basis of their respective numbers. Hence varṇapariṇāma is of five kinds, viz. kālavarṇapariṇāma (transformation of black colour) up to śuklavarṇapariṇāma (transformation of white colour); gandhapariṇāma is of two kinds, viz. surabhogandhapariṇāma (transformation of pleasant smell) and durabhogandhapariṇāma (transformation of unpleasant smell); rasapariṇāma is of five kinds, viz. tiktarasapariṇāma (transformation of bitter taste), kaṭukarasapariṇāma (transformation of sour taste), amlarasapariṇāma (transformation of acidic taste), kaṣāyarasapariṇāma (transformation of astringent taste) and madhurasapariṇāma (transformation of sweet taste); sparśapariṇāma is of eight kinds, viz. karkaśasparśapariṇāma (transformation of hard touch) up to rūkṣasparśapariṇāma (transformation of dry touch); saṁsthānapariṇāma (transformation of shape) is of five kinds, viz. parimaṇḍalasamsthānapariṇāma (transformation of one material substance into spherical shape) up to āyatasam-

nāme, gaipariṇāme, saṁsthānapariṇāme, bhayapariṇāme, vaṇṇapariṇāme, gamdhapariṇāme, rasapariṇāme, phāsapariṇāme, agaruyalahuyapariṇāme, saddapariṇāme, Paṇṇavaṇṇā, 13. 417.

1. Sparśādayaḥ paramāṇuṣu skandheṣu ca pariṇāmajā eva bhavanti, TS. Shā., 5. 24, p. 364.

sthānapariṇāma (transformation of one material substance into rectangular shape).¹ There are stated to be two kinds of bandhanapariṇāma (transformation of binding), viz. snigdha-bandhanapariṇāma (binding transformation of matter by cohesiveness) and rūkṣabandhanapariṇāma, (binding transformation of matter by dryness). The combination of forms of Matter takes place due to the cohesive (attractive=positive) and dry (repulsive=negative) forces of unequal degrees, but it does not occur in the case of equal cohesive force nor in that of equal dry force. That is, no combination takes place between two particles of matter having equal degree of the same property. But there is found to happen a combination of two particles of matter having unequal degrees of force of cohesiveness by two units more with cohesiveness and unequal degree of dryness by two units more with dryness. But no combination is possible to take place between the particles of matter having the lowest degree of two properties whether unequal or equal.²

In the process of combination the higher degree of property transforms the lower one,³ according to the Śvetāmbara view both the śvetāmbara and Digambara views regarding the rules of combination of matter will be discussed in the tenth chapter in detail.

It is explained further that gatipariṇāma (motion-transformation of matter) is of two kinds, viz. sparśagatipariṇāma (transformation of tactile motion of matter, e. g. drawing pitcher goes down to the bottom of water by touching water) and asparśagati (transformation of non-tactile motion of matter) or dīrghagatipariṇāma (long-circuit motion-transformation).

1. BhS., 8. 10. 355; PV., 13; Samavāyāṅga, 22.

2. Goyamā ! duvihe paṇṇatte, taṃjahā niddhabaṃ jhaṇapariṇāma, lukkhabaṃ dhaṇapariṇāma ya, samaṇiddhayāe baṃdhe na hoi samalukkayāe vi na hoi vemāyaniddhalukkhattaṇṇa baṃdho u khaṃdhaṇaṃ niddhassa niddhena duyāhie ṇaṃ lukkhassa duyāhie ṇaṃ niddhassā lukkheṇa uvei baṃdho jahaṇṇavajjo visamo samo vā, Paṇṇavaṇā., 13.

3. Bandhe adhikau pāriṇāmikau ca, TS., V. 36.

mation) and *hrasvagatipariṇāma* (short-circuit motion transformation).¹ *Bhedapariṇāma* (transformation of matter by division) is of five kinds, viz. *khaṇḍabhedapariṇāma* (transformation of matter by the division of it into parts), e. g. separate parts of a broken pitcher up to *utkarabhedapariṇāma* (transformation of matter by division like sawing, e. g. the sawing of a piece of timber). There is stated to be one kind of *agurulaghupariṇāma*, as it is taking place in all substances constantly by rhythmic rise and fall, while *śabdapariṇāma* (transformation of sound) is of two kinds, viz. *surabhiśabdapariṇāma* and *durabhiśabdapariṇāma* (transformations of pleasant and unpleasant sounds).²

Besides, there are stated to be five kinds of *indriyaviṣaya-pudgalapariṇāma* (transformation of sense-object-matter), viz. *śrotrendriyaviṣayapudgalapariṇāma* (transformation of auditory sense-object-matter) up to *sparsendriya-viṣaya-pudgalapariṇāma* (transformation of tactile sense-object-matter). They are again sub-divided into different kinds. *Śrotrendriyaviṣayapudgalapariṇāma* is of two kinds, viz. *surabhiśabdapariṇāma* (transformation of pleasant sound and *durabhiśabdapariṇāma* (transformation of unpleasant sound). Thus *cakṣurindriyaviṣayapudgalapariṇāma* is of two kinds, viz. *surūpapariṇāma* (transformation of matter into beautiful object) and *durūpapariṇāma* (transformation of matter into ugly object) and thus *surabhigandhapariṇāma* (transformation of matter into unpleasant smell) and *durabhigandhapariṇāma* (transformation of matter into unpleasant smell); thus *surasapariṇāma* and *durasapariṇāma* (transformation of matter into good and bad tastes) and a *susparśapariṇāma* and *duḥsparśapariṇāma* (transformation of matter into good and bad touches) respectively of the remain-

1. *Gaipariṇāme...Goyamā ! duvihe paṇṇatte taṃjahā phusamānagaipariṇāme ya aphussamānagaipariṇāme ya ahavā digghapariṇāme ya hassapariṇāme ya, Paṇṇavaṇā, 13. 418.*

2. *Paṇṇavaṇā, 13.*

ning sense-object.¹ All these sense-objects i. e. matters undergo transformation into favourable and adverse states according to chemical behaviour.

Pleasant sounds (matters) undergo transformation into unpleasant sound and unpleasant sounds into pleasant sounds; beautiful matters change into ugly matters and ugly matters into beautiful matters; pleasant matters undergo transformation into unpleasant ones and vice versa, good tasteful matters into bad tasteful-ones and vice versa, matters of pleasing touch into matters of painful touch and vice versa.²

THE SĀMĀKHYA-YOGA VIEW ON TRANSFORMATION OF MATTER

According to the Sāṃkhya-Yoga philosophy, Prakṛti, the fundamental cause, is all-pervasive; it is outside the scope of beginning and end in time. There is the finest seed of motion and rest in it and it cannot exist even for a moment without undergoing transformation into newer and newer forms. It preserves its own fundamental nature as permanent because of there being such nature in it. There is the capacity of expansion in it, i. e. to undergo transformation from the finest conditions into fine conditions and from the fine into the grossest material state by such order on account of which it is only one Reality. Just as the seed of a banyan tree brings forth into existence a huge banyan tree, just so the Prakṛti gives form to the multifarious universe by self-generated capacity without the impetus of any other entity.

“Change is taking place everywhere, from the smallest and least to the highest. Atoms and reals are continuously vibrating and changing places in any and every object. At each moment the whole universe is undergoing change, and the collocation

1. Jīvābhigama, 191-192.

2. Nāyādharmakāhā, 92; Jīvābhigama, 191, 192.

of atoms at any moment is different from what it was at the previous moment.”¹

Energy (Rajas) works on the original infinitesimal units of Mass (Bhūtādi), absolutely homogeneous and absolutely inert and ubiquitous, being devoid of all physical and chemical characters (rūpādhībhīrasaṃyutaṃ) except quantum (paricchinnaṭva pariṇāma). The action of Energy on the original units produces the infra-atomic unit-potentials (tanmātras) charged with different kinds of Energy. It “represents the subtle matter—vibratory, impingent, radiant, etc. instinct with potential energy.” These “potentials” arise from the unequal aggregation of the original Mass-units in different proportions and collocations with an unequal distribution of the original Energy (Rajas).²

Dr. B. N. Seal explains the Sāṃkhya process of transformation of matter in this manner; “the potentials lodged in subtle matter must undergo peculiar transformations by new grouping or collocations to be classed among sensory stimuli—gross matter being supposed to be matter endowed with properties of the class of sensory stimuli, though in the minutest particles thereof the sensory stimuli may be infra-sensible (atīndriya but not anudbhūta).”³

“First, the “potential” of the sound-stimulus is lodged in one class of Tanmātras—particles which possess the physical

1. History of Indian Philosophy, Vol. I. p. 250,

2. The Positive Sciences of the Ancient Hindus, pp. 24-25;

Tanmātrarūpādeḥ kiṃ kāraṇaṃ iti cet svakāraṇadravyā-
ṇāṃ nyūnādhikabhāvena anyo’ anyam prati saṃyogaviśeṣa
eva svajātīyopaṣṭambhādinā vṛddhibhīrāsādikāṃ ca yuktaṃ,
Vide The Positive Sciences of the Ancient Hindus, p. 25.

3. Tasmīmstasmīmstutanmātrāḥ te cā’ aviśeṣiṇaḥ, te ca padār-
thāḥ śāntaḥoramūḍhakhyaiḥ sthūlagataśabdādiviśeṣaiḥ
śūnyā ekarūpatvāt, tathā ca śāntādiviśeṣaśūnyaśabdādima-
ttvameva bhūtānāṃ śabdāditanmātratvaṃ.

Vide The Positive Sciences of the Ancient Hindus, p. 25.

energy of vibration (*parispanda*), and serve to form the radicle of the ether-atom (*ākāśaparamāṇu*); then the potential of the tactile stimulus is lodged in another class of *Tanmātras*, particles which possess the physical energy of impact or mechanical pressure in addition to that of vibration, and serve to form the radicle of the air-atom (*vāyu-paramāṇu*), next, the potential of the colour-stimulus is lodged in a third class of *Tanmātras*, particles, which are charged with the energy of radiant heat and light, in addition to those of impact and vibration, and serve to form the nucleus of the light and heat corpuscle (*teja paramāṇu*), then the potential of the taste-stimulus is lodged in other *Tanmātras*, particles which possess the energy of viscous attraction, in addition to those of heat, impact, and vibration and afterwards develop into the atom of water (*ap paramāṇus*) and lastly, the potential of the smell-stimulus is lodged in a further class of *Tanmātras*, particles which are charged with the energy of cohesive attraction, in addition to those of viscous attraction, heat, impact and vibration, and which serve to form the radicle of the earth atom.”¹

TRANSFORMATION OF MATTER IN THE NYĀYA-VAIŚEṢIKA PHILOSOPHY

Transformation of Matter takes place in the form of chemical action in its different forms in accordance with the

1. The Positive Sciences of the Ancient Hindus, pp. 25-26;
Ṣaḍviśeṣāḥ tadyathā śabdatanmātram sparśatanmātram rūpatanmātram, rasatanmātram, gandhatanmātram ca ityekadvitricatupañcalakṣaṇāḥ śabdādayaḥ pañcaviśeṣāḥ, Vyāsabhāṣya on Yogasūtra, 19, pāda II, p. 88;
Ahaṅkārat śabdatanmātram tataścāhaṅkārasahakṛtāt śabdatanmātrāt śabdasparśaguṇam sparśatanmātram evaṁkrameṇa ekaikaguṇavṛddhyā tanmātrāṇi utpadyante, Sāṃkhyapravacanabhāṣya, 1.62;

following rules ; (1) Kāraṇaguṇapūrvakaḥ kāryaguṇo dṛṣṭaḥ,¹ (2) samānajātīyasaṃyogaḥ dravyārambhakaḥ na vijātīyasaṃyogaḥ, (3) apākajārūparasagandhasparśaparimāṇaikatvaikapṛthaktvagurutvadravatvasnehavegāḥ kāraṇaguṇapūrvakaḥ and (4) rūparasagandhānuṣṇasparśaśabdaparimāṇaikatvaikapṛthaktvasnehāḥ samānajātyārambhakāḥ.²

The Nyāya Philosophy agrees with the Vaiśeṣika on this point “kāraṇaguṇapūrvakaḥ kāryaguṇo dṛṣṭaḥ” (the quality of the composite product is produced by the corresponding quality of the constitutive cause as a rule). But it differs from the latter in regard to a particular class of events, viz. the emergence of new qualities in earth-bodies due to the action of heat. That is, it is a kind of conjunction of the taijasa (fiery) elements by which the previous colour, etc., of the earth-atom are destroyed and another colour, etc., are produced in their place.

On the contact of an earthly object with fire in a furnace

Śabdādīnām mūrttisamānajātīyānām ekaḥ pariṇāmaḥ
pṛthivīparamāṇuḥ tanmātrāvayavaḥ bhūtāntareṣu api
snehausṇyaprapāmitvā avakāśadānāni upādāya sāmānyam
ekavikārārambhaḥ samādheyat, Vyāsabhāṣya;

Sū. 14, padā IV;

Tadyathā gandhatanmātraṃ varjjayitvā catustanmātrāṇām
snehajātīyānām ekaḥ pariṇāmaḥ jalaparamāṇuḥ teṣāṃ ca
mahājalādīḥ, evaṃ gandharasau varjjayitvā auṣṇyajātī-
yānām tritanmātrāṇām tejo' ṇuḥ tebhyaḥ mahātejadīḥ
evaṃ gandharasarūpānām varjjanāt dvābhyām vāyvaṇuḥ
tebhyaḥ mahāvāvyādīḥ, evaṃ śabdatanmātrādahaṅkāra-
mśasahakṛtāt, ākāśāṇuḥ tebhyaḥ mahākāśādīḥ,

Vijñānabhikṣu remarks : atra darśane ayam siddhāntaḥ
śabdāditanmātrapāñcaka kāthinyasnehādivyaṅgyāḥ

pṛthivītvādījātīyaḥ santi, Yogavārttika, Sū, 14, padā IV.

Vide P. S. A. H., pp. 26-27.

1. VS., II. I. 24.

2. PPBhā., Guṇapadārthanirūpaṇam.

a motion is generated in the ultimate constituent particles of it through the forcible contact (abhighāta) or impulsion (nodana)¹ of fire. As a result of this motion the disjunctions are generated by it in its turn; they cause the destruction of the conjunctions in existence between the various parts of the composite and finally convert them to their ultimate particles. Later, on the destruction of their qualities by these particles, again fresh qualities are generated in place of the old ones by a fresh similar contact of fire. They are called pākajas (transformed by chemical action). There are stated to be two kinds of pāka (chemical action), viz. pīlupāka and pītharapāka.²

Pīlupāka

An unbaked earthen pot is black, but after it is burnt in

1. Pārthivaparamānurūpādīoām pākajotpattividhānam ghaṭṭaderāmadravasyāgninā sambaddhasyāgnyabhighātānnodanādvā tadārambhakeṣvaṇuṣu karmānyutpadyante tebhya vibhāgebhyaḥ saṃyogavināśāḥ saṃyogavināśebhyaśca kāryadravyam vinaśyati tasmin vinaṣṭe svatantrēṣu paramānuṣvagnisaṃyogādauṣṇyāpekṣācchayāmādīnām vināśaḥ punaranyasmādagnisamīyogādauṣṇyāpekṣāt pākajā jāyante, PPBhā, Pākajaprakaraṇam.
2. Kāraṇaguṇapūrvakāḥ pṛthivyām pākajāḥ, VS., 7. 1. 6; Pīlavaḥ-paramāṇava eva svatantrāḥ pacyante, tatraiva pūrvārūpanāśāgrimarūpādyutpattiḥ kāraṇaguṇaprakrameṇa cāvayavinirūpādyutpadyate iti pīlupākavādināḥ, VSU., 7. 1. 6; Tatrakāryakāraṇasamudāya eva pacyate iti pītharapākavādināḥ, Ibid., PPBhā., Pākajaprakaraṇam; Pārthivaparamānurūpādīnāmiti yadyapi paramāṇava eva pṛthivi tathāpi te kāryarūpapṛthivyāpekṣayā pārthivā ucyante...yatra pūrveśāṃ vināśādapareṣāmutpādistameva prakāram darśayati...etc. NK., p. 107; KV., p. 183; NM., Pt. II., pp. 11-12; Udyotakara, chap. III, Āhnika 1, Sūtra 4.

the potter's furnace, it becomes red all over, both inside and outside. There is a controversy on this simple phenomenon leading to the question whether does the pot undergo a complete disintegration when acted upon by the fire in the furnace under the influence of fire or does it remain intact in its structure. Does the change of colour from black to red take place in the atoms or in the body with its structure intact? The Vaiśeṣika maintains that when the unbacked earthen pot, etc., are brought into contact with fire, motion is produced in the atoms of it by the forcible striking (abhigḥāta) or pressure (nodana) of fire. Disjunction is produced by this motion in the constituent of the pot and it is followed by the destruction of the conjunction existing between the various constituents of the composite and finally their splitting up into atoms. After the complete disintegration of the body of the unbaked earthen pot a second impact of fire-particles upon the isolated atoms (pīlu-ānus) destroys their original attributes like colour, etc., and converts them to their original conditions. A third impact of fire, which occurs, generates fresh attributes, i. e. red colour, etc., in these atoms in place of the old ones. Thereafter, a reverse motion is generated by the influence of the unseen force of the individual selves in the liberated and homogeneously transformed atoms which combine together by twos. The combination of the red dyads results in the corresponding triads, thus the process leads to the production of the red pot of the original magnitude and shape.¹

The merit of the theory of Pīlupākaja (chemical action in isolated atoms) is that it follows strictly the dictum "The quality in the effect is necessarily the outcome of the correspon-

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1. Āpāke niḥkṣiptasya ghaṭāderāmadravyasya vahninā nodanādbhigḥātādvā tadārambhakeṣu paramāṇuṣu dravyārambhakasamyogavirodhivibhāgenārambhakasamyoganāśe dravyanāśāvaśyambhāvāt dṛśyate hi sthālyāmāhitānām, etc. VSU., 7. 1. 6: PPBhā., Pākaja prakaraṇam.

ding quality of the cause."¹ That is to say, according to the Vaiśeṣika doctrine of Pīlupākaja, the emergence of new qualities takes place in the isolated atoms (pīlus) as a result of the action of heat.

Piṭharapāka

The theory of Piṭharapākaja propounded by the Naiyāyikas maintains that the change of qualities takes place in the whole body (piṭhara), remaining structurally intact,² as a result of the action of heat on the following grounds. It is perceived that a pot remains structurally intact even when it is being burnt by the fire inside the potter's furnace.³ The recognition of the identity of the burnt pot and the unbaked one is not invalidated by a subsequent experience, but it stands as conclusive proof against the Vaiśeṣika view which holds the two pots to be entirely different both numerically and qualitatively.⁴ Secondly, it will be very difficult to explain the point how does the pot preserve its position when placed on the furnace which also is disintegrating by the action of heat, if the Vaiśeṣika theory of the decomposition of bodies by the action of heat is considered to be valid.⁵ Thirdly, the Vaiśeṣika theory of wholesale destruction and reaction makes it difficult to explain the question how should the reconstituted pot possess the same magnitude and shape as the original unbaked pot. Fourthly, it seems to be peculiar that an absolute new pot is found to exist exactly in the same condition in which the unbaked pot was

1. VSU., 7. 6, PPBhā., Pākajaprakaraṇam, 3. VS., 7. 1. 6.

2. VSU., 7. 1. 6; PPBhā., Pākajaprakaraṇam; NK., p. 107; KV., p. 183; NM., Pt. II, pp. 11-12; Udyotakara, chap. III, Āhnika 1, Su 4.

3. VV., p. 447 (Vyomavati)—a commentary on PPBhā. by Vyomaśivācārya ed. CSS. "Evaṁ ghaṭādīnāmavasthāyitvaṁ/na ca ghaṭādervināśe kardamādibhirvinā punarutpattiyuktā, etc.

4. VV., p. 447.

5. VV., p. 447.

placed, even though it is entirely annihilated and an absolutely new one is produced.¹ "The change of position is, however, a matter of natural expectation, as is seen to be the case with bubbles of water among which the disappearance of one is followed by the appearance of another but not necessarily in the same place."² Fifthly, the reproduction of the pot from the atoms into which the old pot was dissolved is supposed to take place without the essential conditions of the wheel, the staff, the measuring rod, etc., and without the activity of the potter. It seems to be a miracle, for the accepted law of causation is given here a wide scope³ against the ordinary course of experience.

The Naiyāyikas deals with the question how does fire enter into the structure of the pot inside and outside without destroying it in this manner that the particles of fire can enter into its structure through its pores, for the porosity of the body of the pot is an undeniable fact proved by the oozing out of water particles out of it or the coolness of the outer surface.⁴ The porosity of an earthen body is demonstrated by the conduction of heat through it to boil the water or by the boiling of the paddy inside the pot without destroying it by way of decomposition and recomposition. The conduction of fire into the structure of the pot is not resisted by the pot nor the entry of the fire particles into it disintegrates its structure, for it is not an absolutely compact and impervious body which might not allow the penetration of fire into it. The entry of the minute particles of fire through the pores into its structure, though a mass of fire cannot effect an entry into it, makes the baking of the whole pot inside and outside.⁵

1. VV, p. 447.

2. NP., p. 312, vide *Studies in Nyāya-Vaiśeṣika Metaphysics*, p. 96.

3. Na ca ghaṭādervināśḥ karmāḥibhirvinā punarutpattiryuktā, VV., p. 447.

4. VSU., VII. 1. 6.

5. Ye bñjāvayavāste pūrvvavyūhaparitāyāgena vyūhāntaramā-

Śrīdhara contends this theory of the Naiyāyikas by raising the point that atoms and dyads constituting the body of the pot are not porous, for atoms are indivisible and dyads are devoid of extensity. If it is so, that would imply that atoms forming a dyad is not conjoined. The conjunction of atoms in a dyad does not leave a gap between them nor the conjunction of dyads in a triad admits of any gap between them, as dyads also do not possess extensity. The pot is a composite and compact body. The fire can effect an entry only into its body, if the constitutive dyads are split up into atoms, thus making possible for the entry of fire to reach the inside of its body.¹

In reply to this argument of Śrīdhara, the Naiyāyikas maintain that there is a possibility of the gap between triads, for conjunction is in respect of parts.² Besides, the passage of

padyante vyūhantarāpattau ca pṛthivīdhāturabdhātunā saṁgrhītantareṇa tejasā, pacyamāno rasadravyaṁ nirvar-ttayati, sa rasaḥ pūrvvāvayavasahito āṅkurādibhāvamāpa-dyate paramāṇvavasthāni bijāni bhavanti'tyetanna prati-padyāmahe, yasmācchālyādibījamucchūnāvasthāmādim kṛtvā yāvadupāntyaṁ śālibījakāryaṁ tāvanna kadācit paramāṇvavasthaṁ bhavati, yadi tu syāt kadācit nopala-bhyeta, NV., Udyotakara, Chap. III, Āhnika 1, Sūtra 4; Prakṛtisūśratayaiva kāryadravyasya ghaṭādiḥ ārambhāt antastejaḥ kaṇānupraveśakṛtapākopapatteḥ alaṁ vināśakai-panayā pīṭharapākapakṣa eva peṣalaḥ, NM., Pt. II; see NV., III. 4; VV., p. 448.

1. NK., p. 109;

Na tāvatparamāṇavaḥ sāntarāḥ, nirbhāgatvāt, dvyaṇukasya sāntaratve cānutpattireva, tasya paramāṇvorasaṁyogāt saṁyuktau cedimau nirantarāveva, sabhāgayorhi vastunoḥ kenacidamśena saṁyogāt kenacidasaṁyogāt sāntaraḥ saṁ-yogaḥ, nirbhāgayostu nāyaṁ vidhiravakalpate sthūladra-vyeṣu pratiyamāneṣvantaraṁ na pratibhātyeva, tryaṇuke-ṣvevāntaraṁ...na kalpyete, NK., pp. 262-3.

2. Yadi cānupraviśya dravyaṁ dravyāntaraṁ vyatibhinatti tena cākṣuśasya rasmer anupraveśāt sphatikādi vinaśtamiti, NV., III. 1. 4, p. 353.

light through the hard transparent bodies like glass and crystal to things situated beyond is the positive proof that the things which appear to be compact are not really so and they cannot resist the penetration of such fine things like the atoms of light.¹ The fact of the passage of one material substance through another demonstrates that take wholesale disintegration of the body is not a necessary precondition for the operation of heat and for the emergence of the new physical qualities.

In answer to the Vaiśeṣika point that the hard and red baked pot is a distinct entity from the soft and black unbaked one on account of their functional characteristics and the impossibility of the occurrence of the contradictory attributes in a self-identical substance, the Naiyāyikas maintain that the identity of a thing can be made only by recognition without contradiction. In this case the recognition of identity is obvious and conclusive. The successive emergence of contradictory qualities does not annul the identity of a thing, e.g. a piece of cloth, when drenched in water, becomes wet and dries, remains the same cloth. In refutation to the Vaiśeṣika view that recognition is not necessarily a proof of identity as it is observed to make a mistake in such cases like the flame of light and the stream of water, the Naiyāyikas explain that the recognition of identity of the flame of light is vitiated by forceful arguments. It is directly perceived that there is the difference of size of the flame at different moments and the wick's oil and the action of fire also change every moment. Therefore it is shown by the difference of causal conditions as well as of the qualities of the flame that the flame in question is not one but a series of phenomena which are misconceived to be identical on account of their quick succession and close similarity. The apparent identity of a stream of water can be explained. So the Vaiśeṣika argument that all recognitions are equally

1. Na viruddhasaṃsparśavattvenā'vayavino bhedo'abhimataḥ, avayavina'ekatvena pratyabhijñānāt, NP., p. 313.

erroneous according to these cause in general and that recognition in the case of the baked one in particular is more vitiated by prejudice than logic.¹

The Vaiśeṣikas opine that the advocate of the theory of Piṭharapākaja accepts the possibility of the recognition of the sameness of magnitude and shape in the case of a slightly mutilated pot, e. g. a pot perforated in the neck with a needle is recognized to be the same pot even though mutilated, but logically it cannot be the same original whole pot,² as it is lost of a part, though small. The whole exists in the totality of the parts and cannot dispense with any of these parts without losing its identity. If the whole is deprived of one or two parts, it ceases to exist and another whole deprived of parts emerges.

In reply to this argument the Mīmāṃsakas argue that "the loss of one or two parts does not entail the disappearance of the whole as the recognition of identity proves its continuance in the parts that are left over."³

The Vaiśeṣikas refute this point by explaining that a whole which exists in a determinate number of parts cannot continue to exist in excision or accretion of part of a two in it. The Mīmāṃsaka example of diminution of magnitude of a piece of cloth due to contraction does not suggest the subtraction of parts or its expansions; a fresh accession of parts does not fit

1. NP., p. 311.

2. KV., p. 188;

Rūpaṃ cāśrayanāśādeva vinaśyati, kāryarūpatvāt naṣṭa-ghaṭarūpavādi (1) tyasyāpi pratyayasya pratyabhijñānirdalitāt, ... piṭharāvayavānāṃ tathā tanmadhyapatitadvyaṇu-kasyāpi kā jīvitavyavasthītatyanumānamapyudyamāsādayati, NLV., pp. 831-2;

VSU., VII. 1. 6. KR., p. 60

3. The Mīmāṃsakas appear to be the earliest exponents of the doctrine of Piṭharapāka.

well so the argument does not dislodge the position of the Vaiśeṣikas.¹

As to the Naiyāyikas' point regarding the absence of the potter and his apparatus for the production of a new pot it is explained by the Vaiśeṣikas that the production of the mutilated pot also did not wait for the potter and his apparatus. So the Vaiśeṣikas maintain that the production of a new pot in super-session of an old one does not necessarily wait for the usual causal condition.²

Besides, according to the Vaiśeṣikas, the process of disintegration of parts in the unbaked pot by the action of fire is gradual and it takes place in and through its parts. So also is the process of reintegration of parts of it. Consequently, there is the emergence of some fresh parts with the changed qualities when there takes place the destruction of some parts. This synchronism of these two processes does not allow to perceive the structural or dimensional change in the reconstituted pot from the disintegrated one.³

It appears from the above analysis of Pīlupāka and Piṭhara-pāka that the latter process seems to be more acceptable for the physical sciences have demonstrated that heat can penetrate into a piece of metal and bring about a change in its internal structure without destroying the magnitude of it. Taste, smell and colour also change with its chemical action. The Jaina view⁴ also supports this contention in this way that there takes place a transformation of guṇas (qualities) in some dravya (substance) having no integration and disintegration of atoms in it.

1. KV., pp. 188-189; VSU., VII. 1. 6.

2. VV., p. 448.

3. NK., p. 110 (p. 265) of Vārāṇasī Saṃskṛta Viśvavidyālaya edition

4. Kammivi puṇa tadavatthevi hoi guṇavippariṇāmo,

Paramāṇu-khaṇḍasaṭṭrimśikā, (14), p. 3;

Ghaṭadravye tadavasthe api pākena prāktanamśyāmarūpā-diguṇanāśadarśanāt (14), Ibid., p. 3.

THE VEDĀNTIC VIEW ON TRANSFORMATION OF MATTER

As already pointed out, the world evolves out of *Māyā* by a process of self-alienation of the Absolute Brahman which produces first *Ākāśa*, and other classes of subtle matter evolve from *Ākāśa* in an ascending linear order. The *Mahābhūtas* (gross elements) are produced by the process of *Pañcikaraṇa* (quintuplication). On the formation of the *Mahābhūtas* once "the different kinds of substance are derived from them by the evolutionary process called *pariṇāma*".¹ There takes place constantly the change of state in Matter." The effect is only the cause in a new collocation."²

There are stated to be two kinds of change, viz. (1) change by a spontaneous process, without external influence including isomeric change (*svābhāvika-pariṇāma*). This *svābhāvika pariṇāma* corresponds to the Jaina *Visrasā pariṇāma*, i. e. spontaneous integration and disintegration, but it is directed against the *Naiyāyika* doctrine of *Ārambhavāda*—action from without, impressed force *abextra* (*adṛṣṭa*) and (2) change as a result of the combination with other substances. It corresponds to the Jaina *pariṇāma* of matters by combination or binding (*bandhanapariṇāma*). "Such combination may produce (a) a compound substance possessing like—qualities with the constituents (*samānajatīyotpatti*) or (b) unlike compounds with new qualities "heteropathic effects" (*vijātīyotpatti*). Any new quality thus evolved through (chemical) combination is called *samhatabbhūta-dharma*, e. g. the intoxicating power of the fermented rice and molasses, which does not exist in the ingredients taken separately (*madyabijānām pratyekam avarttamānāpi samudāyaśaktiā madaśaktiḥ dṛśyate*). This *sambhūyakriyā* (*sambhūyakriyā samutthāna*) corresponds to the chemical combination, and the Vedāntists, like the *Sāṃkhya*, explain this

1. The Positive Science of the Ancient Hindus, p. 89.

2. Ibid.

only as the transformation of the latest Energy (śakti, and-bhūtaśakti) (in a new collocation (saṁsthāna avayava—sanniveśa). But, unlike the mediaeval Sāṁkhya, the Vedānta freely recognises the combination of heterogeneous Bhūtas. Thus Earth, Ap, Tejas, and Vāyu freely combine in a different proportions and groupings to produce the variety of substances in the world. For example, the animal organism is a compound of all the five Bhūtas (pañcabhūtika). It is not merely the concomittant or efficient causes that may be heterogeneous to the material cause as the Naiyāyikas contend, but several heterogeneous substances (or Bhūtas) may unite as "material causes to produce a new substances."¹

I. The Positive Sciences of the Ancient Hindus, p. 90;

Pañcikaraṇa :—

Dvidhā vidhāya caikaikaṁ caturddhā prathamam punaḥ
Svasvetaradvitīyāṁśairyojanāt pañca pañca te.

Yathā trisargaśrutau sṛṣṭānām bhūtānām sphuṭataravyava-
hāranāmarūpasya karaṇopāyatayā trivṛtkaraṇam śrutam
tadvat bhūtapañcakasargaśrutau api tathā, tadānīm pañcikara-
nāntaram ākāśe śabda' abhivyajyate sphuṭatayeti sarvvatra
yojanīyam (Vidvanmanorañjinī)—asti hi śarīre sarvveśāmapī-
bhūtānām kāryasaṁpratipattiḥ avakāśavyūhanapavanakieda-
nakāthinyānām sarvajānānubhavasiddhatvāt, atastatkāraṇatayā
pañcāni bhūtāni ekasmin dehe santi sthite tantupaṭayoriva
avayavāvayavitvameva pañcabhūtadehayoruktaṁ, na ca sparśa-
śūnyatvāt ekadravyatvāt ca ākāśaya ārambhakatvānupapattiriti
vācyam, ārambhavādasya anaṅkikārāt, ekasyāpi dugdhāvaya-
vino dadhyārambhakatvādarśanāt vastutastu pañcānām pañcā-
tmakatvasya darśitatvāt ārambhavādasya nirākṛtatvāt ca
tasmāt siddham śarīram pañcabhautikamiti Ibid., pp. 91-92;

Na tāvat samānajātīyameva ārabhate na bhinnajātīyamiti
niyamo vāsti, samavāyikāraṇe eva samānajātīyatvābhyupaga-
maḥ na kāraṇāntaraviśaya iti tadapi anaikāntikam, nāpi aneka-
meva ārabhate naikamiti niyamo'asti anumanasorādyakarmmā-
rambhābhyupagamāt, ekaiko hi paramāṇuścādyam svakarmā-
rabhate na dravyāntaram saṁhatya ityabhyupagamya dravyā-

In the physical sciences the transformation of Matter is explained by the chemical behaviour of it in the following manner "why molecules can sometimes inter-change atoms and form new substances, and why molecules already formed can sometimes dissociate again into separate atom."¹ These questions correspond to the Jaina Sūtras "Bhedasaṅghātebhyaḥ utpadyante"; "Bhedādaṇuḥ" (Molecules are formed by division, combination and division-cum-combination); the atom is produced only by division). "The answer is to be found by considering in rather more detailed, the significance of the energy relationships involved and the role of temperature. Without defining temperature rigorously, we can assert that the most important consequence of change of temperature is that the amount of energy associated with an atom, molecule, crystal, droplet, or other system changes in the same sense. High temperature means high energy and low temperature means low energy, although in any collection of atoms or molecules the different particles do not all have the same energy; there is a distribution of energies over a range. In a gas, for example, the average velocity will be higher at high temperatures. The tendency of a pair of atoms to approach to the distance of lowest energy of interaction will clearly be affected by what the temperature actually is. If we consider as an example a mixture of sodium and fluorine at such a high temperature that both elements are gaseous, we can safely assert that there will be molecules

rambhe eva anekārambhakatvānīyama iti cet na pariṇāmābhyupagamāt, tadeva tu dravyaṁ viśeṣavadavasthāntaraṁ āpadyamānaṁ kāryaṁ nāmābhyupagamyate, tacca kvacit anekaṁ pariṇamate mṛdbījāṅkurādibhāvena kvacidekaṁ pariṇamate kṣīrādi-dadhyādibhāvena neśvaraśāśanaṁ asti anekaṁ eva kāraṇaṁ janayati iti, ŚBhā., Śārīraka-Bhāṣya, Sūtra, 7, pāda III, Adh., 3, Vide The Positive Sciences of the Ancient Hindus, p. 92.

1. Atoms and the Universe, p. 132.

of sodium fluoride present and free sodium and fluorine. Then at higher temperatures the portion of free sodium and fluorine will increase. Also, the proportion of the fluorine which is in the form of single atoms rather than in the molecules will increase at high temperatures. The precise composition of such a mixture could in fact be worked out if we knew all the quantities of energy actually involved.

In more complex chemical reactions in which atoms are interchanged between molecules there are more quantities of energy to be considered. There are the energies which have to be supplied before the separate molecules can be dissociated and also the energies gained by formation of the new types of molecules. Even in a gaseous mixture there will be ample opportunity for interchanges during collisions between molecules. The course of a given chemical reaction will depend on all these quantities of energy and upon the temperature, and also on the concentrations in which the various [substances are present.]”¹

The chemical behaviour as explained above is similar to the Jaina conception of evolution of matter by the process of combination, of dissociation and of both combination and dissociation of atoms.

Besides, in the physical sciences solid, liquid, and gaseous states of Matter and their respective changes of state are explained in the following manner: “From X-ray studies it is known that in crystalline solids the atoms are all located at definite point in a lattice arrangement. The atoms vibrate about these lattice points, the amplitude of the vibration, increasing with the rise in temperature. At the melting point, which occurs at a fixed temperature different for crystalline substance, the amplitudes of the vibrations have become so large as to disturb the orderly arrangement of the atoms. Heat energy absorbed by the solid during the melting process is

1. Atoms and the Universe, pp. 132-133.

used in overcoming the attractive forces between the molecules and so producing increased molecular potential energy. Amorphous substances, such as, wax, tar and glass, as well most alloys, do not have sharp melting points but rather pass from the one state or phase to the other over a range in temperature of a few degrees. The change from the solid to the liquid state is known as melting, or fusion, the reverse change, as freezing. During freezing the molecules in settling down into their lattice positions have their potential energy changed back into kinetic energy, part of which is given as heat energy to the immediate surroundings.

When a liquid changes to the gaseous state, a process known as vaporization, there is a further much larger increase in the average distance between molecules. Heat energy is absorbed by the liquid to supply this increase in potential energy, or internal energy, of the substance. In addition, a portion of the absorbed heat energy is consumed in doing external work in the expansion against the pressure confining the substance. In the reverse change from the gaseous to the liquid phase, known as condensation, energy must be given up as heat energy to the surroundings.

The transition directly from the solid state to the gaseous state, called sublimation, also occurs. It takes place; for instance, when "dry ice" at atmospheric pressure changes to carbon dioxide gas without going through the liquid phase. To produce sublimation there is, of course, an absorption of heat energy in order both to increase the potential energy of the molecules and to do the external work in the large expansion against the pressure of the atmosphere."¹

The Jaina conception of change of state of Matter "*Bheda-saṅghātābhyām cākaṣṣāḥ*" (Molecules produced by the combined action of division and combination can be perceived by the eyes) is comparable to the process of change of states of Matter from the solid to the liquid and from the liquid to the

gaseous and the process of the reverse change of state from the gaseous to the liquid and from the liquid to the solid state as explained in physics. According to the Jaina Metaphysics, the invisible matter becomes visible by the combined process of division and combination, and not by division, for "when a molecule of minute size splits, it does not give up its minuteness. Hence it is invisible. Again another minute molecule splits. It combines with another molecule, gives up its minuteness and attains grossness. Then it becomes visible."¹

It is to be noted that in the gaseous state the particles of matter become invisible, while in the liquid and solid states they become visible. That is to say, some of the molecules are visible and some are invisible, though they are composed of even an infinite number of atoms.



1. Reality, p. 155;

Anantānantaparamāṇusamudayaniṣpādyo'api kaściccā-
kṣuṣaḥ kaścidadākṣuṣaḥ, tatra yo acākṣuṣaḥ sa katham
cākṣuṣo bhavattīti ceducyate, bhedasaṅghātābhyāṁ cākṣuṣaḥ
na bhedāditi ka kātropapattiriti cet? brūmaḥ sūkṣma-
pariṇāmasya skandhasya bhede sauṣmyāparityāgādacā-
kṣuṣatvameva sauṣmyāpariṇataḥ punaraparāḥ, satyapi
tadbhede anyasaṅghātāntarasamyogāt sauṣmyāpariṇāmo-
parame sthauḥyotpattau cākṣuṣo bhavati,
SS., 5. 28 (Comm)., p. 299.

On the basis of the Āgamic statement Umāsvāti explains the combination of matter in this manner that it takes place by virtue of the properties of cohesive and dry forces⁴ which are associated with them. The origination of the material aggregate (i. e. molecules) occurs only as a result of the mutual contact of unitary (discrete) ultimate atoms, etc.⁵ For this reason, besides the contact (*saṁyoga*), there is something else for

1. Paramāṇupoggalā ..vemaṇipiddhayāe dvemaṇalukkhayāe
vemaṇapiddhalukkhayāe ..bamhe samuppajjai, etc.,
BhS., 8. 9. 345;
See also Paṇṇavaṇā, 13, 418; Bhandhaṣaṭṭrimśikā, p. 10.
2. Do paramāṇu-poggalā egayao sāhaṇṇanti donhaṁ para-
māṇu poggalāṇaṁ atthi siṇhakāe, BhS., 1. 10. 80.
3. Khamhevi ya ṇaṁ asāvaṁ sayā sa-niyaṁ uvacijjai ya
avacijjai ya, BhS., 1. 10. 80.
4. Snigdharūkṣatvādbandhaḥ, TS.; V. 32, p. 420.
5. Snigdharūkṣayoḥ pudgalayoḥ sprṣṭayorbandho bhavati,
TS., Bhā., 5. 32, p. 420.

its production. The purport of the aphorism "Snigdhārūkṣatvādbandhaḥ" is to show this fact. In addition to the mutual conjunction, it is also necessary that there should be the properties—cohesiveness and dryness (i. e. attractive and repulsive forces) in them. When cohesive and dry constituent parts combine mutually with each other, there takes place their binding-transformation of oneness (integration). The molecules like dyads, etc., are produced by this combination. There can be two kinds of combination of cohesive and dry constituent parts, viz. similar (sadṛśa) and dissimilar (visadṛśa). The taking place of combination of the cohesive constituent with the cohesive one and that of the dry constituent with the dry one is called similar combination (sadṛśabandhana), while the combination of the cohesive constituent with the dry one is dissimilar combination (visadṛśabandhana).¹ So there are stated to be two kinds of bbandhanapariṇāma (binding-transformation of matter), viz. snigdhabandhanapariṇāma (binding-transformation of the cohesive constituent parts) and rūkṣabandhanapariṇāma (binding-transformation of the dry constituent parts).²

The general rules of the combination of matters are as follows : (1) There does not take place a combination of the cohesive and dry constituent elements of matter having the quantum of the minimum (lowest) properties (energies),³ i. e. there does not occur a combination of ultimate atoms having the minimum quantum of properties. (2) On account of there being equal quantum of properties there does not take place a

1. TS., 5. 34.

2. Bāṁdhanapariṇāme naṁ Bhaṁte ! kaivihe paṇṇatte ? taṁjahāṇiddhabāṁdhanapariṇāme, lukkhabāṁdhanapariṇāme ya, Paṇṇavanā; 13;

Samaṇiddhayāe bāṁdho na hoi samalukkhayāe vi na hoi Vemāyapiddhalukkhattāṇeṇa bāṁdho u khamdhāṇaṁ, etc. Ibid.

3. Na jaghanyaguṇānāṁ, TS., V. 33, p. 421.

combination of similar constituent particles of matter.¹ That is to say, there is no possibility of a combination of the cohesive constituent part with the cohesive one and that of the dry constituent part with the dry one. (3) Ultimate atoms having equal degree of cohesiveness or dryness, and being of the same kind, cannot combine with ultimate atoms of their own kind.² (4) There takes place a combination of similar or dissimilar constituent parts having the difference in their degrees of cohesiveness or of dryness by two units more.³

In the three sūtras “Na jaghanyaguṇānām Guṇasāmye sadṛśānām, Dvyadhikādiguṇānām tu”, the first sūtra forbids the combination of matters on the ground that there cannot take place a mutual combination of ultimate atoms having the minimum properties of cohesiveness or of dryness in them.⁴ It is revealed by this fact of negation that there can be a mutual combination of all cohesive or dry constituent elements having medium and maximum⁵ degree of these properties. But in this rule also there lies an objection which is explained in the next sūtra “Guṇasāmye sadṛśānām.” According to it, there cannot take place a mutual combination of similar constituents having equal degrees of properties of cohesiveness

1. Guṇasāmye sadṛśānām, TS., V. 34, p. 422.

2. Ibid.

3. Dvyadhikādiguṇānām tu, TS., V. 35.

4. Jaghanyaguṇasniḡdhānām jaghanyaguṇarūksāṇām ca paraspareṇa bandho na bhavati, TS. Bhā., 5. 33, p. 421.

5. Ityevametau jaghanyaguṇasniḡdharūksau viḡyānyeṣām madhyamotkr̥ṣṭasniḡdhānām rūksaiḥ sniḡdhaisca rūksāṇām paraspareṇa bandho bhavati iti, TS., pp. 421-22;

Atrāha-uktaṁ bhavatā—jaghanyaguṇavarjānām (snigdhānām) rūksaṇa rūksāṇām ca sniḡdhena saha bandho bhavati, atha tulyaguṇayoḥ kimatyantapratīṣedha iti ? atrocyate na jaghanyaguṇānamityadhikṛtyedamucyate,

TS. Bhā., p. 422.

or of dryness. In this way there cannot occur a combination of the cohesive ultimate atoms with the cohesive ultimate atoms having equal degree of dryness.¹ The contention of this negation shows that there can be a combination of similar ultimate atoms having unequal degrees of properties—cohesiveness and dryness.² Having abridged the expressed meanings in the third sūtra “Dvyadhikādiguṇānām tu” the position (or limitation) for a combination of unequal quantum of properties of similar constituents has been determined. In accordance with this rule there can take place a combination of similar constituents having unequal degree of property—cohesiveness or dryness, when the property of cohesiveness or of dryness of one constituent element is more than the property of cohesiveness or of dryness of another constituent element by two, three, four units, etc.³ Therefore, if the property of cohesiveness or of dryness of one constituent element is more than the property of cohesiveness or of dryness of the other constituent element by only one unit, then there cannot be a combination of similar constituent elements.⁴

There is no difference in the reading of the aforesaid three sūtras in the Śvetāmbara and Digambara traditions, but

1. Guṇasāmye sati sadṛśānām bandho na bhavati tadyathā-tulyaguṇasnigdhasya tulyaguṇasnigdhenā, tulyaguṇarūkṣasya tulyaguṇarūkṣeṇa iti, TS. Bhā., 5. 34, p. 422.
2. Atrāha-sadṛśagrahaṇām kimapekṣata iti? atrocitate-guṇavaiśamyē sadṛśānām bandho bhavati, Ibid., p. 423
3. Dvyadhikādiguṇānām tu sadṛśānām bandho bhavati, TS., p. 424;
Tadyathā—snigdhasya dviguṇādhikasnigdhenā, dviguṇādyadhikasnigdhasya ekaguṇasnigdhenā, rūkṣasyāpi dviguṇādyadhikarūkṣeṇa, dviguṇādyadhikarūkṣasya ekaguṇarūkṣeṇa., Ibid.
4. Ekādiguṇādhikayostu sadṛśayorbandho na bhavati atra tu śabdo vyāvṛttiviśeṣanārthaḥ, pratiśedha vyāvartayati bandhaṁ ca viśeṣayati, TS. Bhā., 5. 35, p. 424.

there lies the difference of interpretations made by the commentators. According to the Bhāṣya and Vṛtti of the Tattvārthādhi-gama sūtra, when both ultimate atoms are having the lowest degrees of energy, then only their combination is ruled out.¹ That is, if one ultimate atom is endowed with minimum quality and another ultimate atom is not possessed of minimum degree of quality, according to the Bhāṣya, then there takes place their combination.² But according to the explanation of the Digambara texts—Sarvārthasiddhi, etc., there cannot be a combination of one ultimate atom having minimum degree of quality with another ultimate atom³ having non-minimum degree of quality like a mutual combination of two ultimate atoms having the lowest degree of property. "There is no combination between atoms which are characterized by the lowest degree of greasiness or dryness. It as follows: There is no combination of one degree of greasiness with one, two, numerable, innumerable or infinite degrees of greasiness. In the same manner, there is also no combination of one degree of greasiness with one, two numerable, innumerable or infinite degree of dryness. Similarly, it should be understood with regard to one degree of dryness.

If so, it would imply indiscriminate combination among all degrees of greasiness and dryness other than those of the lowest degree."⁴

1. Jaghanyaguṇasniḡdhānām jaghanyaguṇarūkṣāṇām, ca paraspareṇa bandho na bhavati, TS. Bhā., p. 421.

2. Atrāha-uktaṁ bhavatā-jaghanyaguṇavarjānām (snigdhānām) rūkṣeṇa rūkṣāṇām ca snigdhena saha bandho bhavattī, TS., Bhā., p. 422.

3. SS., 5. 34 (Comm).

4. Reality, p. 159.

Teṣām jaghanyaguṇānām nāsti bandhaḥ tadyathā ekaguṇasniḡdhasyaikaguṇasniḡdhena dvyādisaṁkhyeyānantaguṇasniḡdhena vā nāsti bandhaḥ tasyavaikaguṇasniḡdhasya ekaguṇarūkṣeṇa dvyādisaṁkhyeyāsaṁkhyeyānantaguṇarū-

According to the Bhāṣya and Vṛtti of the Tattvārthādhigama sūtra in all the three sūtras the meaning of the word 'Ādi' has been accepted in the sense of three, etc. Therefore, in spite of their being the quantum (amśa) of cohesiveness or of dryness of another constituent element more by two, three, four up to countable, countless and infinite units than that of any one constituent element, there will take place a combination in this case. Only if it is more by one unit of property, then there will be no combination. But the Digambara Ācāryas interpret that the combination of ultimate atoms is accepted, if there be only two degree (units) of property more, i. e. like one degree of property in the case of there being three, four up to a numerable innumerable and infinite degrees more, a combination of ultimate atoms is not possible. Ācārya Pūjyapāda explains : "The increase by two units means four degrees of either property (of greasiness or dryness). The particle 'Ādi' (etc.) indicates manner. The manner shows increase by two units. By that five degrees, etc., are ruled out. This implies a combination between similar and dissimilar types of atoms if there is difference in degrees of either property by two units. There is no combination of an atom of two degrees of greasiness with one, two or three degrees of greasiness. But there is a combination of it (an atom of two degrees of greasiness) with four degrees of greasiness. The same (greasiness of two degrees), however, does not combine with five, six, seven, eight, numberable innumerable and infinite degrees or greasiness. Similarly, there is a combination of three degrees of greasiness with five degrees of greasiness. But there is no combination of this (greasiness of three degrees) with lesser or greater degrees of greasiness (than two). Greasiness of four degrees combines

kṣena vā nāsti bandhaḥ. tathā ekaguṇarūṅṣasyāpi yojyamiti;
 Etaṁ jaghanyaguṇasniḡdharūṅṣau anyeṣāṁ sniḡdhānāṁ
 rūṅṣānāṁ ca paraspareṇa bandho bhavati, SS., 5. 34,
 (Comm.)

with six degrees of greasiness, but not with the rest. Similarly, it must be understood in other instances. In the same manner, dryness of two degrees does not combine with that of one, two or three degrees. But it combines with dryness of four degrees. The same does not combine with five and higher degrees of dryness. Similarly, it should be understood that there is a combination of dryness of three degrees, etc. with that of two degrees higher than itself. It should be understood similarly with regard to dissimilar types (i. e. greasiness and dryness).¹ 'It is also described in the scriptures', "with the exception of the lowest degree, wherever there is difference of two degrees in greasiness and dryness, there is combination between similar or dissimilar types, such as greasiness with dryness and greasiness with dryness."²

In all the three aforesaid sūtras according to the Bhāṣya and Vṛtti, the rule of combination which takes place because of there being an increase of the degree of properties by two units, three units, etc. is applicable only to similar constituent elements.³ But in the explanation of the Digambara Ācāryas that rule is applicable also to the combination of dissimilar ultimate atoms, just as it is applicable to the cause of similar ultimate atoms. "The term sadṛśa" is intended to indicate combination of the same kind in case there is difference in the degree of greasiness and dryness.

From this it follows that there would be combination between atoms of the same kind and the opposite kind, if there be difference in the degrees of greasiness and dryness."³

1. Reality, pp. 160-161; SS., V. 36 (Comm.)

2. Dvyadhikādiguṇānām tu sadṛśānām bandho bhavati, TS. Bhā., p. 424.

3. Reality, p. 160;

Guṇavaiśamyē sadṛśānāmapi bandhapratipattiyartham sadṛśagrahaṇam kriyate. Ato viśamaguṇānām tulyajātīyānāmatulyajātīyānām ca, SS., V. 35 (Comm.), pp. 305-6.

In the process of combination the equal and higher degrees of property transform equal and lower ones respectively.¹ In the case of equal degree of property the combination of similar constituents does not take place, but there occurs the combination of dissimilar constituents, e. g. the combination of two degrees of cohesiveness with two degrees of dryness or three degrees of cohesiveness with three degrees of dryness. In such case, some particular equal degree of property transforms another equal degree of property into its own nature.² That is to say, according to substance, field, time and condition, cohesiveness sometimes transforms dryness into cohesiveness and sometimes dryness also transforms cohesiveness into dryness, having equal degree of property. But in most cases the higher degrees of property can transform the lower ones into their own nature, e. g. the five degrees of cohesiveness, i. e. three degrees of cohesiveness turn into the magnitude of five degrees by the nature of relation. Like this the five degrees of cohesiveness transform the three degrees of dryness into own nature. When dryness is more, then it also transforms cohesiveness of less degree into its own nature.³

According to the Digambara tradition in which the reading is "Bandhe adhikau pārīṇāmikau ca", it is not desirable that

1. Bandhe samādhikau pārīṇāmikau, TS., V. 36.
2. Bandhe sati samaguṇasya samaguṇapārīṇāmako bhavati adhikaguṇo hīnasyeti, TS., Bhā., V. 36, p. 426.
3. Sati bandhe—saṃghaṭṭalakṣaṇe visrasādvāreṇa tulyaguṇo dviguṇasniḡdhastulyaguṇastaddviguṇarūkṣasya pārīṇāmakaḥ svamatena snehaguṇena rūkṣaguṇamātmasātkaroti, evaṃ rūkṣaguṇaḥ kadācit pārīṇāmakaḥ, svagatena rūkṣaguṇena snehaguṇamātmasātkaroti pārīṇāmayaṭṭi, guṇasāmye tu sadṛśānāṃ bandhapraṭiśedhaḥ, imau tu visadṛśāveko dviguṇasniḡdho anyo dviguṇarūkṣaḥ, sneharūkṣayośca bhinnajāṭīyatvānnāsti sādṛśyaṃ, tathā adhikaguṇaḥ—triguṇasniḡdho hīnaguṇasya ekaguṇasniḡdhasya pārīṇamayitā, anena hyekaguṇasniḡdhastriguṇasniḡdhatāmāpadyate, TS., pp. 426-27.

one equal degree of property transforms another equal of property into its own nature. But it avers that in the process of combination the higher degrees transform the lower ones.¹ For example, "treacle full of sweetness transforms particles of dust, etc., that surround it, by imparting its sweetness to them. Similarly, higher degrees transform lower degrees. So greasiness and dryness of four degrees, etc., transform greasiness and dryness of two degrees. For that reason the previous state disappears and another state of four degrees is manifested. Thus combination (oneness) is produced. Otherwise the two would appear separate in spite of union, as in the case of a cloth woven with black and white yarn."²

COMBINATION AND SEPARATION OF ULTIMATE ATOMS AND MOLECULES

In the Jaina Āgama Bhagavati Vyākhyāprajñapti a detailed account of combination and separation of ultimate atoms and molecules having two units up to infinite units (pradeśas) has been given in a systematic way. As for example, two ultimate atoms combine together because of their property of cohesiveness (force of attraction); they may disintegrate into two discrete units (atoms) by the process of disintegration (i. e. by the force of repulsion); thus they become individual discrete ultimate atoms again.³ In this way three ultimate atoms com-

1. Bandhe adhikau pāriṇāmikau ca, SS., V. 37.

2. Reality, p. 161;

Yathā kliṇo guḍo' adhikamadhurarasah paritānām reṇvā-
dānām svaguṇotpādanāt pariṇāmikaḥ, tathā'anyo'apya-
dhikaguṇaḥ alpyasaḥ pāriṇāmika iti kṛtvā, dviguṇādisnig-
dharūkṣasya caturguṇādisnigdharūkṣaḥ pāriṇāmiko bhavati
tataḥ pūrvāvasthāpracyavanapūrvakaṁ tātīyikamavasthā-
ntaraṁ prādurbhavatītyekatvamupapadyate. itarathā hi
śuklakṛṣṇatantuvat saṁyoge satyasyapāriṇāmikatvātsarvaṁ
viviktarūpeṇaivāvatiṣṭheta, SS., 5.27 (Comm).

3. BhS., I. 10. 80.

bine together because of their cohesiveness (force of attraction) into a molecule. If that aggregate disintegrates into two parts, the one part becomes an ultimate atom on the one side and the other part becomes an aggregate having two units. If it disintegrates into three parts, there become three discrete ultimate atoms. Similarly, four and five atoms combine together to form aggregates and those aggregates are non-permanent, for the process of integration and disintegration always takes place in them.¹ In this manner the account of combination and separation of infinite ultimate atoms has been discussed in great detail.

Infinite ultimate atoms integrate into one molecule having infinite units (pradeśas). On its disintegration it gets divided into two, three up to ten, countable, countless and infinite units. When disintegrating into two parts, the one part becomes one discrete ultimate atom by singleness and the other one becomes an aggregate having infinite units or two aggregates having infinite units. When disintegrating into three parts, there become two discrete ultimate atoms by singleness and one aggregate having infinite units or there become one ultimate atom by singleness, one dyad and one aggregate having infinite units up to or there become one ultimate atom by singleness, one aggregate having countless units and one aggregate having infinite units or there become one ultimate atom by singleness, two aggregates having infinite units or there become one dyad and two aggregates having infinite units—thus up to or there become by oneness one aggregate having ten units and two aggregates having infinite units or there become an aggregate having countable units by oneness and two aggregates having infinite units or there become by oneness one aggregate having countless units and two aggregates having infinite units or there become three aggregates having infinite units. While disintegrating into four parts, there become by singleness three ultimate atoms and one aggregate having infinite units; thus *catuṣkaśaṁyoga* up to

1. Bhs., 1. 10 80.

asaṁkhyātasamyoga should be understood; all these are discussed like the account of countless divisions as stated above. Similarly, the account of infinite divisions also should be known. Only difference is that one infinite division (anantaka) more should be stated up to or there become by oneness countable aggregates having countable units and an aggregate having infinite units, or there become countable aggregates having countless units and an aggregate having infinite units or there become countable aggregates having infinite units. When disintegrating into countless parts, there become countless ultimate atoms and an aggregate having infinite units or there become countless aggregates having countless units and one aggregate having infinite units or there become countless aggregates having infinite units. When disintegrating into infinite parts, there become infinite discrete ultimate atoms.¹

PUDGALAPARIVARTTA (ASSEMBLING TOGETHER OF ULTIMATE ATOMS WITH MATERIAL SUBSTANCES)²

As a result of integration and disintegration of ultimate atoms there can follow infinitesimal pudgalaparivarttas of paramāṇus³ (union of ultimate atoms with material substances). There are stated to be seven kinds of pudgala-parivartta, viz. audārika-pudgalaparivarttas (assemblings of gross matters), vaikriya-pudgala-parivarttas (assemblings of trans-

1. BhS., 12. 4. 445.

2. Pudgalaiḥ pudgaladravyaiḥ saha parivarttāḥ—paramāṇūnām milanāni pudgalaparivarttāḥ samanugantavyāḥ anugantavyā bhavanti iti hotoḥ akhyotaḥ parūpitāḥ bhagavadbhiriti gamyate makarṣa—prakṛtāsaittprabhavaḥ, BhS., 12. 4. 446 (Comm).

3. Haṁtā Goyamā ! essi naṁ paramāṇupoggalāṇaṁ sāhaṇa-nābhedāṇuvāenaṁ anantāṇaṁ poggalapariyattāṇaṁ anantāṇanta-poggalapariyattā samanugantavvā bhavaṁ—iti makkhāyā, Ibid., 12. 4. 446.

formable matters), taijasa-pudgala-parivarttas (assemblings of luminous matters), kārmaṇa-pudgala-parivarttas (assemblings of karmic matters), manaḥpudgala-parivarttas (assemblings of mental particles or mind-dusts), vāk-pudgala-parivarttas (assemblings of speech-matters) and ānaprāṇa-pudgala-parivarttas (assemblings of respiration-matters).¹

Taijasa and kārmaṇa-pudgalaparivarttas are eguttariyā (one or two or three in the minimum or countable up to infinite in the maximum) in all cases; manaḥpudgalaparivarttas are eguttariyā in all five-sensed beings but there is none in the case vikalendriyajīvas (two-sensed up to four-sensed beings), vāk-pudgala-parivarttas are thus and the same; the particular difference is this that it is not applicable in the case of one-sensed beings. Ānaprāṇa-pudgala-parivarttas take place in all cases of five-sensed beings up to that of the vaimānikas² (celestial beings).

Audārika-pudgala-parivarttas occur because audārika-śarīra-prayogadravyas (material substances applied by the gross body) in the form of audārikaśarīra (gross physical body) are received, bound, pervaded, transformed, held, settled, immersed, attained and developed by soul, existing in the gross physical body and in the forms of limbs and they are transformed, dissociated, discharged and given up by it. Similarly, vaikriya-pudgala-parivarttas (assembling together of the transformable matter) also should be understood. The particular difference is this that it should be stated that it is received by soul existing in vaikriyaśarīra (transformable body).

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1. Goyamā ! sattavihe poggalapariyaṭṭe pannatte, tamjabā-orāliya-poggalapariyaṭṭe vevviya teyapoggalapariyaṭṭe kammāpoggalapariyaṭṭe maṇapoggalapariyaṭṭe vaipoggalapariyaṭṭe āṇāpāṇu-poggalapariyaṭṭe, Ibid.
 2. BhS., 12. 4. 446; 'Eguttariyā' means one or two or three in the minimum or countable up to infinite in the maximum. Another meaning is 'Having one as the latter part (in the case of compound numerals).'

The remaining account is one and the same; all up to ānaprāṇapudgala-parivartta should thus be known. The particular difference is that all ānaprāṇa-pudgala-prayoga-sarvadravyas (all material substances applied by respiration) are assembled together as ānaprāṇa-pudgala (respiration-matter). The remaining is one and the same as before.

Audārika-pudgala-parivartta becomes free by the cycle of utsarpiṇī and avasarpiṇī kālas. Similarly, vaikriya-pudgala-parivartta up to ānaprāṇa-pudgala-parivartta also should be known.

Of those audārika-pudgala-parivarttanirvarttanakāla (time for being free) upto ānaprāṇapudgala-parivarttanirvarttanakāla, the least of all is kārmaṇa-pudgala-parivartta-nirvarttanakālas, taijasa-pudgala-parivartta-nirvarttanakāla in infinite times more than kārmaṇa-pudgala-parivartta-nirvarttanakāla, audārika-pudgala-parivartta-nirvarttanakāla is infinite times more than audārika-pudgala-parivartta-nirvarttanakāla, manañ-pudgala-parivartta-nirvarttanakāla is infinite times more than ānaprāṇa-pudgala-parivartta-nirvarttanakāla; vāk-pudgala-parivartta-nirvarttanakāla is infinite times more than manañ-pudgala-parivartta-nirvarttanakāla; and vaikriya-pudgala-parivartta-nirvarttanakāla is infinite times more than vāk-pudgala-parivartta-nirvarttanakāla. Of these audārika-pudgala-parivartta up to ānaprāṇa-pudgala-parivarttas, the least of all are vaikriya-pudgala-parivarttas; vāk-pudgala-parivarttas are infinite times more than vaikriya-pudgala-parivarttas; manañ-pudgala-parivarttas are infinite times more than vāk-pudgala-parivarttas; ānaprāṇa-pudgala-parivarttas are infinite times more than manañ-pudgala-parivarttas; audārika-pudgala-parivarttas are infinite times more than ānaprāṇa-pudgala-parivarttas; taijasa-pudgala-parivarttas are infinite times more than audārika-pudgala-parivarttas; taijasa-pudgala-parivarttas are infinite times more than audārika-pudgala-parivarttas and kārmaṇa-pudgala-parivarttas.¹ This account of pudgalaparivarttas (assembling

1. BhS., 12. 4 447.

together or joining of ultimate atoms with material substances) throws light upon the complex system of the combination of Matter with regard to all beings from different aspects, such as, time, etc.

THE SĀMĀKHYA VIEW ON THE COMBINATION OF MATTER

According to the Sāmkhya, the process of combination of different elements of Matter is explained in the following manner : there are stated to be two classes of aggregates, viz. (1) those of which the parts are closely united and fused, being lost in the whole (ayutasiddhāvayavaḥ) and mechanical aggregates or collocations of distinct and independent parts (yutasiddhāvayavāḥ samūhāḥ).

As an aggregate of the first kind a substance may be classified into two groups, viz. the Bhūtas and their 'isomeric' modifications (bhūtabheda and bhūtavikāra) and chemical compounds (militadravya saṃhatabhūtārtha). The second class of the substance may be sub-divided into two group, viz. (1) those compounds of atoms of the Bhūta class, i. e. of different isomeric modification of the same Bhūta, and (ii) those compounds of atoms of different Bhūta classes. In the former there takes place the contact between 'isomeric' atoms (sajātīya-saṃyoga), while in the latter there occurs the contact between heterogeneous atoms (vijātīya-saṃyoga). The first contact brings about the intimate combination.¹ "The isomeric atoms by a peculiar liberation of energy (sajātīyopastaṃbha—the action of similars on similars) are attracted towards one another, and being rivetted as it were, form the so-called material cause (upādānakāraṇa) of the compound product."²

1. Saṅgaḥ saṅgākhyāḥ yāḥ saṃyogaviśeṣāḥ tenaiva dravyānām vikāro bhavati, Pravacanabhāṣya, p. 136,

Vijñānabhikṣu;

See The Positive Science of the Ancient Hindus, p. 49.

2. P. S. A. H., p. 49.

The second kind of contact (that between unlike atoms of heterogeneous Bhūtas) begins with a liberation of Energy (upaṣṭambha), which breaks up each of the Bhūtas; and taking particles (or atoms) of one as nuclei or radicles, groups particles of the rest round these radicles in a comparatively free or unattached conditions".¹

This Sāṃkhya process of combination of atoms is comparable to the Jaina view that "there would be combination between atoms of the same kind and the opposite kinds, if there be difference in the degrees of greasiness and dryness."²

In the above process the one Bhūta performing the function of providing the radicles is called upādāna-kāraṇa (material cause), while the others bringing about the release of Energy by their collocation (upaṣṭambha, avaṣṭambha or viṣṭambha) are known as nimittakāraṇa (efficient cause)³. It is demonstrated by the examples of the Rasas as modifications of Ap (water) with earth-accretions that this process applies to the attributes (guṇas) and the Bhūtas.⁴

1. P. S. A. H., p. 49.

2. Reality, p. 160, SS., (Comm), V. 35.

3. Evamekaikaguṇasambhavāt pradhānaguṇam āśritya apradhānaguṇāḥ pariṇāmabhedān pravarttayanti, Vācaspati, Sāṃkhyatattvakaumudī on kārīkā, 15, Vide P. S. A. H., p. 50.

4. Yathā ākāśādekarasam salilam patitam nānārūpāt samśleṣāt bhidyate, Gauḍapāda on kārīkā, 17, Vide P. S. A. H. p. 50.

Tatra'api (taijase śarīre api) bahutarapārthivāvayavāvaṣṭambhāt, alpatve ca anupabhogāt; Aniruddha on Sūtra 112, Chap. V.

Jātiśāṃkaryasya asmākamadoṣatvāt sāmāgrīsamavadhāne anekairapi indriyair ekadā ekavṛttyutpādane bādhakam nāsti; Sāṃkhya Pravacanaśāstra, Vide P. S. A. H., p. 50.

According to Aniruddha, "both 'isomeric' and 'heterogeneous' combinations are real causes of constitutive contact."¹ "But in the later Sāṃkhya-Pātañjala the current teaching denied this—'bahūnāmupādānayoḡāt' (Sūtra 102, Chap. V), where Vijñānabhikṣu notes—bahūnām bhinnajātīyānām copādānatvaṃ na dṛṣṭamiti sajātīyamevopādānām itarācca bhūtacatuṣṭayamu-paṣṭambhakam".²

It is admitted by the Sāṃkhya that the dyad (dvyaṇuka) may be formed by atoms in constituting substances.³ In the mediaeval Sāṃkhya-Pātañjala it was conceived under the influence of the Nyāya-Vaiśeṣika that the intimate combination took place in the case of the structure of molecule formed of 'isomeric' atoms, while in the case of a molecule formed of heterogeneous atoms there occurred only grouping of comparatively free or loosely attached atoms round a radicle atom (vyūhana) with liberation of Energy (upaṣṭambha, avaṣṭambha or viṣṭambha) and the setting up of unequal stress and strain (guṇavaīṣamyavimardda—Īśvarakṛṣṇa). There existed a fundamental (radical) difference between these two structures of molecules. But this distinction is not applicable to the Tanmātras (infra-atomic potentials or sūkṣma-bhūtas), the forms of subtle matter which could combine into close "fusion whether homogeneous or heterogeneous". As for instance, sūkṣmaśarīra (subtle body), the vehicle of the sentient principle is admitted by Vijñānabhikṣu to be pañca-bhūtātmaka (penta-Bhautika), i. e. all the five infra-atomic potentials (Tanmātras) function as upādānakāraṇas (material causes). "though the gross body (the animal organism) is stated

1. Ārambhakasamyoga, e. g. bhautika-vāyordehārambhakatvaṃ, Aniruddha on sūtra 113, Chap. V., Vide P. S. A., H., p. 50.

2. The Positive Sciences of the Ancient Hindus, p. 50.

3. Tathā anyonyāśrayāśca dvyaṇukavat guṇāḥ, Gauḍapāda on kārīkā 12;

The Positive Sciences of the Ancient Hindus, p. 52.

to be a "heterogenic" compound with the Earth-Bhūta as radicle or base.¹ But according to the original Sāṃkhya-Pātañjala, the production of a new substance by the contact of dissimilar elements (vijātyasamyoga) was admitted "as freely as in Vedānta, and was conceived as in nowise differing from the formation of a compound of atoms of the same Bhūta class".²

The Sāṃkhya view of chemico-physical action does not make any distinction between 'collocations of isomeric' and those of heterogeneous atoms", as basically they are all collocations of the Guṇas; even it is urged by Vijñānabhikṣu that "the qualities of a compound substance are not necessarily the result of similar qualities in the compound elements."³

THE NYĀYA-VAIŚEṢIKA VIEW ON THE COMBINATION OF MATTER

According to the Nyāya-Vaiśeṣika Philosophy, the ultimate atoms cannot exist in discrete state in creation;⁴ nevertheless, the atmospheric air consists of the means of atoms in a loose uncombined state.⁵ One earth-atoms combines with another

1. The Positive Sciences of the Ancient Hindus, p. 53;
Adhiṣṭhānaśarīraṃ ca sūkṣmaṃ pañcabhūtātmaṃ vākṣyate, tanmātrakāryaṃ yat bhūtapañcakaṃ līṅgādhiṣṭhānaṃ śarīraṃ—Sāṃkhya Pravacanabhāṣya, sūtra 11 and 12, Chap. III. Sthūlaśarīraṃ pāṛthivameva anyāni ca bhūtāni upaṣṭambhakāni, Ibid., 19, chap. III.
2. The Positive Sciences of the Ancient Hindus, p. 54.
3. Ibid.;
4. Sajātyakāraṇaguṇasyaiva kāryaguṇārambhakatā iti tu tesāṃ (tārakikānām) api na niyamaḥ, vide P.S. A. H., p. 54.
5. Śivāditya, Saptapadārthī, vide commentary.
6. Stimitavāyustu paramāṇusamūha eva anārabdhadravyaḥ, Saptapadārthī, p. 21.

by an original tendency to form a dyad (dvyaṇuka). In the same manner the dyads of other elements of Matter are constituted. The ultimate atoms are endowed with inherent vibration (parispandana) and it is the rule that while combining in pairs except in the case of the chemical action under the influence of heat, the original qualities of the ultimate atoms generate homogeneous qualities in the dyads.¹

In the orthodox view, the primordial infinitesimal atoms begin with an unceasing vibratory motion² and an inherent impulse which leads them to combine into dyad. The dyads constitute larger molecules, having combined by threes, fours, fives, etc. and the variety of elementary substances. The particular arrangement of them is determined by the physical causes as well as by the unseen force (Adṛṣṭa).³

It appears that this view has been originated by Praśastapāda.⁴ According to another view maintained by the Vaiśeṣika

1. Kāryaṇaṁ kārāṇaṇapūrvakam, VS., 7. 1. 6.
2. Anavarataparispandamānā parimitapavanādiparamāṇavaḥ, Raghunātha Śiromaṇi, Vide P. S. A. H., p. 100; Gatīślatvāt patatravyapadeśāḥ patantīti, Nyāya Kusumāñjali, Udayana, Vide P. S. A. H., p. 100.
3. Dvyaṇukairbahubhirārabhyate ityapi niyamo na, dvābhyāṁ tasyāṇuparimānotpattau kārāṇasadbhāvenāṇutvotapattāvārambhavaiyarthīyāt, bahuṣu tvaniyamah, kadācit tribhīrārabhyate iti tryaṇukamityucyate, kadāciccaturbhīrārabhyate, kadācit pañcabhīriti yatheṣṭam kalpanā ..adrṣṭavaśāt tathā tathā teṣāṁ vyūho yathā yathā tadārabheṣu aparajātayo vyajyante, nanvadrṣṭakāritā sarvabhāvānām srṣṭiḥ, NK., Prthivīnirūpaṇam, pp. 80-81; Cf. Vācaspati's Report, Bhāmatī, chap. II, pāda II, sūtra 2; Yadā caturāṇukamārabhate caturṇām dvyaṇukānāmārambhakatvāt.
4. Paramāṇudvyaṇukeṣu bahutvasamkhyā tairārabdhe kārya-dravye tryaṇukādīlakṣaṇe, PPBhā., Parimāṇanirūpaṇam, p. 57.

system, ultimate atoms possess an inherent tendency to combine with one another, but some combine in pairs, others in triads, others in tetrads, etc., either by ultimate atoms falling into the groups of threes, fours, etc., direct, or by the successive addition of one atom to each preceding aggregate. The latter process of combination by the successive addition of one atom to each preceding aggregate is similar to the Jaina view of the formation of dvipradeśika —, tripradeśikaskandha, etc. Therefore, like the Jaina tripradeśikaskandha the Vaiśeṣika tryaṇuka inheres in three atoms, but not in three dvyaṇukas (dyads). Similarly, the same process of combination of atoms follows in the case of tetrads, pentads, etc.¹

According to Praśastapādabhāṣya, the dyads are combined by threes, fours, fives, etc. (tryaṇuka, caturaṇuka) to constitute different isomeric modifications. "The variety of Earth-substances is due to differences in the arrangements of the molecules (e. g. their greater or less density, and above all, their grouping or collocation, vyūha, avayavasanniveśa), which account for the specific characters (aparajāti) manifested by these isomeric substances."²

1. Caturvidhāḥ paramāṇavaḥ kṣitijalāgnivāyunām, dvābhyām paramāṇubhyām dvyaṇukamārabhyate tribhiḥ paramāṇubhistryaṇukamārabhyate iti krameṇa sthūlakāryadravyasyotpattiḥ, Utpala, Chapter I, Śloka 7;
Vṛhatsaṃhitā, cf. also Śrīdhara's admission, "Athavā yadi paramāṇavo dvyaṇukamārabhya tatsahitāstryaṇukamārabhante tryaṇukasahitāstu dravyāntram tathāpi, kuta viśvasya agrahaṇam, Vide P. S. A. H., p. 101;
see yadāpi dve dvyaṇuke caturaṇukamārebheta, ŚBhā., (Śāṅkabhāṣya), II. XX. 2, see P. S. A. H., p. 101.
2. amāṇajātīyasamyogaḥ dravyārambhakaḥ na vijātīyasamyogaḥ, Vide P. S. A. H., p. 98;
Sā pṛthivī sthairyādyavayavasanniveśaviśiṣṭā aparajātībahutvopetā, PPBhā., Pṛthivīnirūpaṇam, p. 12;
Sthairyam niviḍatvam ādiśabdāt praśīthilatvādiparigrahaḥ

As already discussed in the previous chapter, an elementary substance like earth produced by primary atomic combination may undergo qualitative change under the action of heat in a furnace, according to two theories, viz. Pīlupāka (chemical action of isolated atom) of the Vaiśeṣikas and Pīṭhara pāka (chemical action of the composite structure) of the Naiyāyikas, i. e. (1) the decomposition into homogeneous atoms, transformation of atomic qualities and finally recombination, all under the operation of heat and (2) the assuming of new characters by the molecules and larger aggregates under the influence of heat without decomposition into homogeneous atoms or change of atomic characters.¹

paramāṇvādiṣu aparajātyabhāve api adṛṣṭavaśāt tathā tathā teṣāṃ vyūhaḥ yathā yathā tadārabdheṣu aparajātayo vyajyante, NK., Pṛthivīnirūpaṇam, p. 81;

Sthairyaṃ sthiratā cirakālāvasthāyitvamiti yāvat. Ādigrahaṇādviṣṭambhakatvaṃ jalādivyūbhavirodhitvaṅca avaya-vasanniveśaḥ tattatsāmānyaviśeṣābhivyāñjakasamsthānaviśeṣaḥ, na etadṛavyāntare sambhavati, jalādīnām yatkiñcit sparśavad-vegavad-dravyopanipātamatrenaiva bhaṅguratvāt, K. V. Ibid. (Pṛthivīnirūpaṇam).

1. Teṣāmanumānena vināśaḥ parikalpyate. Sarvāvayaveṣu antarbahiṣca pākāpūrbbakapūrbbarūpādivilakṣaṇaguṇopalabdherantaḥpraveśaḥ kṛṣṇānoranumīyate tena vegavatā banhidravyeṇa nodanāt abhigṛhātāt vā nyūnam ghaṭādyārambhakeṣu avayaveṣu kriyā jāyate kriyāto vibhāgaḥ vibhāgāt dravyārambhakasamyogavināśaḥ, tadvināśāt dravyavināśaḥ, pakkaśca śyāmādiguṇāṇavajahataḥ raktāḍiguṇāntarayogamanubhavantāḥ—adṛṣṭapreryamānāḥ parasparam samyujya dvyaṇukādiprakrameṇa tādṛśameva ghaṭādikāryamārabhante, evaṃ tapanātapadṛśyamāneṣu āmrādi-phaleṣu eṣa eva nyāyaḥ, śarīre, api udaryeṇa tejasā pacyamāneṣu annapānādiṣu rasamaladhātubhāvena pariṇāmamupagacchatsu prāyeṇa pratikṣaṇamutpādavināśau sambhavata iti, NM. (Bhūta-caitanyapūrvvapakṣa), Vide P. S. A. H., p. 102;

THE BUDDHIST VIEW ON THE COMBINATION OF MATTER

In the Buddhist Philosophy the process of combination and dissociation of particles of matters are not clearly dealt with as is treated in other Indian systems of thought. Nevertheless, it is implied from the Buddhist conception of *saṅghātaparamāṇus* (combined atoms) like *saptadravyaka*, *aṣṭadravyaka*, *navadravyaka* and *daśadravyaka*, and *kalāpa* that the atoms of earth, water, fire and air and the atoms of colour and shape, sound, odour, taste and tangible cannot "appear independently without being combined with the fundamental ones, in the ratio of four atoms of primary matter to one of secondary."¹ So the minimum number of four atoms of general materiality integrated with each atoms of colour, odour, taste and secondary tangibility—matter is necessary "for their actual appearance in life."² In the case of particular piece of matter resounded, atoms of sound being added to it make the combination

Prakṛtiśuṣiratayaiva kāryadravyasya ghaṭādeḥ ārambhāt antastejaḥ kaṇānupraveśakṛtapākopapatteḥ alaṁ vināśakalpanayā, pīṭharapākapaḥṣa eva peṣalaḥ, NM., (Bhūta-Caitanya-Pūrvvapakṣa);

Ye *biḥāvayavāste pūrbāvayūhaparitāgena vyūhāntaramāpadyante vyūhāntarāpattu ca prthividhāturabdhātunā saṁgrhīta'antareṇa tejasā pacyamāno rasadravyaṁ nirvarttayati sa rasaḥ pūrbāvayasahito' ankurādibhāvamāpadyate, paramāṇvavasthāni biḥāni bhavanti iti etanna pratipadyamāne, yasmācchālyādibhāmucchūnāvasthāmādiṁ kṛtvā yāvadupāntyaṁ śālibhājakāryaṁ tāvanna kadācit paramāṇvavasthāṁ bhavati, yadi tu syāt kadācit nopalabhyeta, Udyotakara, chap. III, Āhnikā, I, Su. 4, Vide P. S. A. H., p. 103.*

1. The Central Conception of Buddhism, p. 12.

2. *ibid.*

comprising nine different atoms.¹ "The combined atoms (saṃghāta-paramāṇu) alone appear in phenomenal reality, the simple ones, or infra-atomic elements, presumably, were relegated to the transcendental reality, in accordance with the general character of a Buddhist element. This device made it an easy task for the Buddhists to oppose indivisibility of atoms."²

According to the later Vaibhāṣikas, air-atoms form air by aggregation, fire-atoms constitute fire by aggregation, water-atoms form water by aggregation and earth-atoms form earth by aggregation. The elements combine to constitute inorganic substances, organism and organs.³

In the physical sciences the combination of Matter is explained in this way that atoms are capable of free existence. "Every atom exerts a force upon every other atom."⁴ They combine with other atoms and form molecules by the force of attraction "when the atoms are at a distance apart greater than their normal diameters, changing to a force of repulsion if the atoms are forced very close together. Thus there will be a tendency for atoms, because of their force of attraction to draw together and stick."⁵ That is to say, the atoms of one substance combine with those of another to form molecules in the process of chemical reactions taking place between two substances. The molecules constituting a substance attract each other by the inter-molecular forces of attraction. This force of attraction between them is very strong when the distance between

1. The actual number of atoms in a saṃghātaparamāṇu will be much greater, since each atom of secondary (bhautika) matter needs a set of four primary atoms of its own, but if dhātus alone are reckoned, the number will express the classes (dhātu) of elements (dharma) represented (cf. Ab. K. ii. 2), Ibid.
2. Ibid.
3. P. S. A. H., pp. 92-93.
4. Atoms and the Universe, p. 126.
5. Ibid.

them is small. It vanishes when the distance exceeds the range of molecular attraction, i.e. there is the repulsive force. "If there are no such repulsive forces, atoms would not have individual existence and would all merge into each other. So the very existence of discrete atoms is a *de facto* demonstration of the existence of repulsion. But we can see, a possible origin of this force in the structure of the atom as a positively charged nucleus surrounded by a cloud of negative electrons. If we consider two such atoms approaching so closely together that they overlap greatly (assuming for the purposes of this argument that this does not cause any distortion of the individual atoms) we eventually arrive at a condition in which the two are very close together, and the two spherical electronic clouds have become nearly coincident. It is obvious that the most important force under these circumstances will be the repulsion of the two positively charged nuclei upon each other, because the electronic clouds will so thoroughly mixed up that their contributions will act almost equally on both nuclei. At small distances the repulsion of nuclei becomes very powerful and this is, in part at least, the origin of the general repulsive force between atoms."¹

The molecules also tend to dissociate from each other by an inherent motion to which they are subject. They are subject to the simultaneous action of two forces—the intermolecular forces of attraction tending to combine them into a compact mass, while the inherent molecular motions tend to spread them out.

Snigdhātva (cohesiveness) and rūkṣātva (dryness) of Matter conceived in Jaina Philosophy may correspond to the force of attraction and the force of repulsion respectively as inherent properties in Matter of the physical sciences. As the attractive and repulsive forces are most indispensable for the combination and separation of atoms and the molecules in the physical sciences, so also snigdhātva (cohesiveness) and rūkṣātva (dry-

ness) are main properties of Matter for the combination and dissociation of atoms and aggregates of atoms, according to Jaina metaphysics. Thus the Jaina conception of the combination of Matter runs parallel to the conception of molecular formation of the physical sciences, though they differ in regard to the complex process of chemical behaviour of matters.

CONCLUSION

Value of the Jaina Conception of Matter

A study of the Jaina conception of Matter reveals that it was natural for the Jainācāryas to begin their metaphysical inquiry to the problem with the notion of Dravya (substance), a notion which has a continuous history in Jaina Philosophy from its very beginning up to the present time as is found in the case of notion of substance from Aristotle to Descartes. The Jains had developed the distinction between Dravya and its guṇas (attributes) partly in order to mark logical difference between the ultimate subjects of knowledge and partly also to answer puzzles about change and identity.

The next step is to divide guṇas of Dravya or guṇas which it may be said to possess into two categories : first, the essential attributes, those which make it the kind of thing it is, and secondly, the accidental attributes, which it may acquire and lose without changing its essential nature.¹ "In Spinoza's terminology the words 'necessary and contingent' are generally substituted for 'essential and accidental.'"²

The Jaina concept of Dravya is comparable with the concept of substance of Spinoza, the central theme of his metaphysics. "A substance, all of whose attributes and modifications can be deduced from its own essential nature, and all whose attributes are therefore necessary and not contingent, can be described as cause of itself, (*causa sui*) and only such a substance can be so described. It is Spinoza's fundamental argument in part I of

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1. Sarvārthasiddhi, Pūjyapāda, p. 136;
Tattvārtha Rājavārtika, p. 502;
Tattvārtha Śloka-vārtika, ch. V. 41, p. 446;
TS., Bhā , Ch. V, p. 435.
 2. Spinoza, Stuart Hampshire, A Pelican Book, p. 32.

the Ethics that there can be only one substance which is *causa sui*, and that this single substance must be identified with the universe conceived as a whole, this unique all-inclusive totality he therefore calls God or Nature (*Deus sive Natura*)."¹

Spinoza has so strictly defined substance that "nothing whose attributes are the effects of outside causes can be called a substance; a substance by definition is such that all its attributes or modifications, can be explained in terms of its own nature and are therefore necessary and not contingent."²

According to Spinoza, "There can be only one substance so defined, and nothing can exist independently of or distinct from, this single substance; every thing which exists must be conceived as an attribute or modification of or as in some way inherent in, this single substance; this substance is therefore to be identified with Nature Conceived as a whole or as the totality of things. This substance must be infinite in its nature "...it possesses an infinite number of attributes each of which is itself infinite."³

The Jaina Concept of a single *Dravya* is a unique all-inclusive totality like the single substance of Spinoza, identified with the universe conceived as a whole. That which has *guṇas* (qualities) and *paryāyas* (modifications) is a *Dravya* (Substance).⁴ *Dravya* is the inherent essence of all things, manifesting itself in and through infinite modifications, and it is endowed with qualities and it reveals permanence and change inherent in it to be real.⁵ And *Dravya* is endowed with its unchanging nature of existence.⁶ It possesses an infi-

1. Spinoza, Stuart Hampshire, A Pelican Book, p. 36.

2. Ibid., p. 38.

3. Ibid., pp. 38-39.

4. TS., ch. V. 37, p. 427.

5. PS., 8.

6. *Pravacanaśāra*, Pt. II, 3, p. 123.

nite number of attributes each of which is itself infinite like that of the single substance of Spinoza.

The Jainas made the metaphysical inquiry into the concept of Dravya from the noumenal and phenomenal points of view with the doctrine of manifoldness. Dravya has been conceived by them as the principle of Reality from the aspect of generality, while its particular characteristics are Jivadravya (sentient principle or living substance) and Ajivadravya (non-sentient principle or non-living substance) from the particular aspect.¹ But Jivadravya and Ajivadravya do not form any two-substance doctrine, representing the world of animated things and the world of non animated things as independent and self-contained systems. According to a similar concept of "a unique substance of Spinoza", thinking substance and extended substance are one and the same substance, comprehended now under this attribute, now under that."²

Jaina Philosophy has conceived six categories of Dravya (Substance) as determined by their respective natures, viz. Dharma (Principle of Motion), Adharma (Principle of Rest), Ākāśa (Space), Jiva (Soul), Pudgala (Matter) and Addhāsamaya³ (Time).

Matter is conceived by every system of Indian philosophy in its own perspective. The Jaina concept of Matter comes nearer to the concept of Matter of the physical sciences in some respects, as it is conceived as the substance in the sense of stuff of which the universe is constituted. It is one of the ultimate principles or substances of which phenomena are manifestations.

An analysis of the nature of Jaina Pudgala (Matter) reveals that it is a permanent, non-living, extensive, physical, corporeal and concrete, active, disintegrating and integrating, and

1. Anuyogadvāra Sūtra, 123.

2. Spinoza, p. 64.

3. BhS., 25. 4. 733-4.

changeable substance. It is infinite in number, co-extensive with the cosmic universe, possessed of the capacity to be received by Soul and to be assistance to it. It is characterized by origination, decay and permanence without giving up its essential nature of existence.

The main features of the nature of Jaina Pudgala (Matter) except grahanaguna (capacity to be received by Soul) are similar to those of the nature of Matter conceived in the physical sciences to a considerable extent.

Jaina Pudgala represents the elements of Matter, Earth, Water, shadow, objects of four senses, karmic matter and atom form the whole material universe in the grossest to the finest forms. The most valuable point in this conception of the elements of Matter is that each of its effect, when studied, is ultimately found to have been constituted of one or more of these elementary particles. The Jaina conception of the elements of Matter appears to be unique in its originality, for it has accepted not only earth, water, fire and air, etc. as the basic elements of Matter, but it has given place to indriya (sense-organ), karmic matter and leśyā (condition of soul) as material elements in its fold on the basis of psycho-physical aspects of the material substance. The value of the Jaina conception of the basic elements of Matter, such as, sulphur, iron, copper, tin, mercury, lead, silver, gold, etc. lies in the fact that the Jainācāryas conceived the idea of pure elements of Matter as distinguished from the base forms of it.

On the emergence of the Jaina and other Indian concepts of atomicity of Matter from the first chemical and physical observation it came to light that ultimate particles were much smaller than the samples of matter. They are inapprehensible to the senses and their existence is inferable. It appears that Jaina Metaphysics commenced with the conception of the grossest form of Matter and entered into its subtle form by stages in dealing with the problem of the elements of Matter.

Four general properties of Matter colour, taste, smell and touch, its impenetrability, cohesion, adhesion, greasiness (snigdhatva=attractive force) and roughness (rūkṣatva=repulsive force), oscillation or vibration and motion are the common properties of Matter to both Jaina Metaphysics and physics.

The Jaina conception of the effects of Matter as earth, water, fire, air, vegetation, body, speech, mind and respiration and its manifestations as sound, combination, fineness, grossness, shape, division, darkness, shadow, heat and light is old in Indian Philosophy. All these effects and manifestations of Matter except 'shadow' have been accepted in the physical sciences in some forms.

The classification of Matter by the Jainas into one group to infinite groups from various points of view are valuable in an analysis of Matter in the light of the physical sciences.

The Jaina theory of transformation of Matter as a result of internal and external causes, propounded on the basis of various aspects, such as quality, etc. is a valuable contribution to the Indian concepts of transformation of Matter. Besides the Jaina concept of its transformation brought about by the processes of integration, disintegration and integration-cum-disintegration is identical with the theory of chemical behaviour of atoms and molecules as explained in the physical sciences. The process of the combination of Matter as explained in Jaina metaphysics on the basis of certain principles of interactions between atoms which give rise to the existence and behaviour of matter in bulk bears some points of similarity with that of the physical sciences regarding inter-atomic forces and the combination of atoms.

The greatest value of the Jaina conception of Matter lies in the fact the reality of Matter, with its noumenal and phenomenal aspect, has amply and brilliantly been expressed together with its potent factors—origination, decay and permanence from the points of view of substance, locus, time and condition

in the daring speculation, not sacrificing the logical aspect of knowledge in the thoughts of its metaphysical and physical existence and in the synthetic views of its qualities and modifications, elements, karma, atomism, properties, effects and manifestations, classifications, its atomic structure and properties, vibration and motion, its transformation and combination, as it exists in space and continues in time with its static and dynamic forces in the cosmic universe.



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Index

- Abbāga, 129
 abhāṣātmaka, 205
 abhavya jīvas, 241
 Abhidhammattha saṅgaha,
 146
 Abhidharmāmṛtaśāstra, 56
 Abhidharma, 98
 Abhidharma Hṛdaya, 146
 Abhidharmakośa, 58, 59, 92
 abhighāta, 117, 302, 303
 abhimāna, 72
 abhiniveśa, 87
 ābhyantara, 76
 ābhyantarānirvṛtti, 76
 abhyudaya, 168
 acākṣuṣa skandha, 294
 Acarama, 268
 Ācārya, 59
 Ācārya Hemacandra,
 72, 74, 75
 Ācārya Kundakunda, 16, 41
 Ācārya Nāgasena, 92
 Ācārya Pūjyapāda, 17, 19, 23,
 34, 74, 125, 193, 197, 199,
 200, 215, 321
 Ācārya Rāmānuja, 108
 Ācārya Śāṅkara 97, 108, 113-
 116, 118-22, 124
 acchedya, 130
 acchinna pudgala skandha,
 280
 acetana, 117
 acetana jagat, 114
 Acetana Prakṛti 218
 Acetanatattva, 12-15, 26-28
 Acetanatattva of Ajīvadṛavya,
 16
 achinna, 234
 Acit, 14
 Acit of the Rāmānuja Vedā-
 nta, 25
 adāhya, 130
 addattādāna, 104
 Addhāsamaya, 12, 24, 220,
 276, 342
 Adharma 16, 17, 22, 85, 171,
 174, 342
 Adharmāstikāya, 12, 23, 24,
 220, 270, 274, 275
 Adharmāstikāyapradeśa, 220
 adhiṣṭhānas, 73
 adhiṣṭhita, 117
 adhruvavargaṇā, 248
 ādi, 40, 321
 ādimat, 289
 Adṛṣṭa, 85, 86, 116, 117, 286,
 333
 ādya karma, 117
 Āgama, 41
 aghāta 90
 Aghātaśarīra, 47, 161, 162
 agrāhaṇa vargaṇā, 241
 agrāhya, 130, 234
 agrahya vargaṇā, 241
 Agurulaghu, 24
 agurulaghubuṇa, 23, 24

- agurulaghu pariṇāma 258,
 295, 297
 agurulaghutva, 24
 abhāṅkāra, 198
 āhāra, 57
 āhārakaśāstra, 189, 243, 244
 ahimsā, 103
 ajaghanya anutkr̥ṣṭagūṇa
 kālaka paramāṇu, 222
 Ajīva, 17
 Ajīvadravya, 11, 12, 16, 23, 28
 342
 ajīvadravvyaparyāya, 217
 Ajīvaparyāya, 220
 Ajīvatattva, 24, 26
 Ājīvika, 105
 Akalaṅka, 37, 126, 151, 193,
 197-99, 226
 ākāra, 37
 Ākāśa, 12, 16, 17, 18, 21, 22,
 26, 27, 49, 50, 171-73, 204,
 209, 211, 260, 270, 310,
 342.
 ākāśadhātu, 55
 ākāśaparamāṇu, 300
 Ākāśāstikāya, 12, 23, 24, 220,
 275
 Ākāśāstikāyadeśa, 220
 ākāśāstikāyapradeśa, 220
 ākāśa tanmātra, 50
 ākāśatva, 111
 akhaṇḍa, 31
 ākr̥ti, 37
 akṣarātmaka, 203
 ākṣepakṛta 104
 akṣigolakakṛṣṇasāra, 73
 akuśala, 97
 akuśala citta, 58
 ālambana, 62
 ālāpana, 212
 ālayavijñāna, 99
 ālepana, 213
 āloka, 59, 62, 138, 258
 alpaparamāṇu, 241
 amlarasa pariṇāma, 295
 amśa, 321
 anādi, 40
 Anādi Avidyā, 94
 anādi parināmas, 40
 anakṣarātmaka, 205
 aṇamīta pajjavā, 8
 anantabhāga, 129
 anantaka, 326
 anantnantāṇuvargaṇā, 241
 Anantāṇu, 255, 256
 anantāṇuvargaṇā, 241
 anantānantapradeśika skandha,
 290, 291
 anantaparamāṇuvāda, 32, 135
 antarāya karma, 212
 ananta vargaṇā, 242
 ānaprāṇa pudgala parivarttas,
 327, 328
 ānaprāṇapudgala parivarttanir-
 vattana kāla, 328
 ānaprāṇa pudgala prayoga sar-
 vadvavyas, 328
 anavasthā, 116
 anekapradeśī, 228
 aṅgopāṅga, 76
 aṅgula, 77
 aniccata, 55

- anipphana rūpa, 55, 56
 anirdiṣṭasamsthāna, 11
 Aniruddha, 331
 anispanna rūpas, 57
 anityatā, 57, 58
 aniyamita, 277
 antaḥkaraṇa, 88
 antarapradeśikas, 77
 antarāyakarma, 99
 antya, 214
 antyaviśeṣa 140, 263
 aṇu, 234
 anubhāga, 99
 anucātana, 215
 anudbhūta, 299
 anudbhūta rūpa, 175
 anugata, 102
 anujāti, 252
 aṇukāraṇatā, 118
 aṇumātratva, 118
 aṇu-paramāṇuvādin, 32
 anuśreṇi, 178
 anuśreṇi-avagāhanā, 209
 Anuśreṇigati, 179, 182
 aṇutva, 113-15, 226-27
 ap, 18, 26
 apākajarūparasagandhasparśa
 301
 apāna, 200
 aparajāti, 334
 aparendriya, 265
 aparispandana, 172, 174
 aparispandātmaka, 38, 171, 176
 177
 aparyāptika, 206
 apavartanā, 100
 Ap-dbātu, 65
 apekṣita, 214
 ap-kāya, 48, 184
 apodhātu, 57
 Apradeśa, 269
 apraghātin gati, 178
 Aprāpyakāri, 151
 apratigha, 92
 Apratighātatva, 283
 apratighātin, 284
 apratiṣṭhita, 187
 ap-tanmātra, 50
 apūrva, 88, 94-97
 Ārambhaka paramāṇu, 260
 Ārambhavāda, 51, 126, 131,
 310
 Aristotle, 44, 340
 Arthaparyāya, 38, 174
 arūpa, 93
 arūpt, 92
 Arūptjivadravyas, 12
 arūptajjivaparyāya, 220
 arūpin, 36
 arūpitva, 37
 asaṁkhyātāṇuvargaṇā, 241
 asaṁkhyātapradeśika, 233
 asaṁkhyāta pradeśika
 skandha, 290
 asaṁkhyātasamyoga, 326
 asaṁkhyeyapradeśāvagādha,
 77
 Asaṅga, 58
 asmitā, 87
 asparśagati, 296
 asprṣṭagati, 179
 āśritāśraya, 123

- āśritāśrayabhāva, 123
 āśr'taśrayadravyabhāva, 123
 aṣṭadravyaka, 266, 336
 astikāyadravya, 170
 astitva, 10, 24, 35
 aśubha, 97, 235
 aśuklākṛṣṇa, 98
 ātapa, 62, 202, 216, 217
 atimuktaka, 77
 atīndriya, 7, 175, 299
 atīndriya vyāpāra, 175
 Ātmā, 7, 12, 14, 18, 22
 audārikagrahaṇayogyavargaṇā
 248
 audārika-pudgala parivartta
 326-28
 audārika-pudgalaparivartta-
 nirvattana kāla, 328
 audārikaśārīra, 189, 327
 audārika śārīra prayogadra-
 vya, 327
 audārika vargaṇā, 242, 247
 audayika, 99
 aup śamika, 99
 avagāhana, 22
 avagāhanā, 218
 āvalikā, 280, 281
 avasarpinī kāla, 328
 avaṣṭambha, 330, 331
 avastu, 118
 avyakta śārīra, 86
 avayava, 107, 116, 239
 avayavas of paramāṇu, 108
 avayava sanniveśa, 334
 avayavavāda, 108
 avayavin, 107, 116, 144, 231,
 239
 avayavin rūpa, 109
 avibhājya, 130
 avidyā, 87, 121
 avigraha, 178
 avijñapti, 54, 58, 92, 93, 97
 avinirbhāgin, 129
 aviśeṣa, 234
 avyākṛta citta, 58
 avyakta, 174
 avyakta śārīra, 86
 avyāpta, 166
 āyatana, 62
 āyus karma, 99
 ayutasiddhāvayavaḥ, 329
 Badara, 232, 236, 239
 bādara bādara, 48, 239
 bādara nigoda, 187-88
 bādarānigodavargaṇā, 248
 bādarapariṇāma, 293, 295-96
 bādarapariṇata anantaprade-
 śika skandha, 233
 bādara pudgalaskandha, 48
 bādarasūkṣma, 239
 bādarasūkṣma pudgalaskandha,
 48
 bāhalla, 77
 bāhya, 76
 bandha, 104, 202, 212
 bandhana, 100
 bandhanapariṇāma, 317
 bandhapariṇāma pratighāta
 283
 Bārhaspatya, 27
 Baudha, 107
 Bauddhācārya, 29
 Bhagavati Uyākhyā prajñapti,
 20, 71, 178, 193, 215, 324

- Bhāṣā dravya, 206-207
 bhāṣātma, 205
 bhāṣāvargaṇā, 248
 Bhāskara, 124
 Vātsyāyana 115
 bhāsvara, 158
 Bhāṣya and Vṛtti,
 of Tattvārthadhī gaṇa, 320-21
 Bhāṣyavṛtti, 321, 322
 Bhaṭṭa school, 2
 bhautika, 50, 73
 bhautika dravya, 21
 bhautika sarga, 90
 Bhautikatva, 166
 bhāva, 30, 38, 40, 88, 91,
 171, 223, 254, 268, 269
 bhāvabhāṣā, 206
 bhāvagaṇa, 139, 272-73
 Bhāvakarma, 80-86, 93, 95 97
 Bhāvaleśyā, 101, 102, 104
 bhāvamana, 196 97
 bhāvaparamāṇu, 254
 Bhāvavāk, 193
 bhāvendriya, 73, 75-77
 bheda, 202, 214, 294
 bhedādaṇu, 256, 291
 bhedana, 48, 239
 bhedaparīṇāma, 295, 297
 bheda saṃghāta, 294
 bhedatva, 169-70
 bhedyā, 130
 bhinna, 234
 bhūta 22, 25, 26, 27, 65, 66,
 157-57, 260, 311, 332
 bhūtabheda, 329
 bhūtabhautikatattva, 32
 Bhūtacaitanyavāda, 14, 15
 Bhūtadi, 259, 299
 Bhūtādi-tāmasāhankāra, 50
 bhūtaśakti, 311
 Bhūta sarga, 92
 Bhūtavāda, 15, 25
 bhūvikāra, 156, 329
 Brahman, 7, 13, 24, 113, 121
 Brahmavādina, 28
 Brahmavādīn Vedāntin, 108
 Buddha, 168
 Buddhaghosa, 54, 56, 72
 buddhīndriyas, 73
 Buddhism, 8
 Buddhist, 7, 28, 54, 71-73, 93
 128, 131, 146 48 161-66,
 184, 194, 197, 198, 202,
 219, 232
 Buddhist Abhidharma, 74
 Buddhist citta, 7
 Cakkhu, 55
 Cakṣu, 57
 Cakṣurindriya 54, 78
 Cakṣurindriyaviśaya pudgala
 parīṇāma, 297
 Cakṣuṣā, 293
 cālajaghanya, 179
 Cālana gamana, 179
 Carama, 268
 Cārvākas, 12, 14, 27, 107
 Caturāṇuka, 113, 334
 Catuṣkaśaṃyoga, 325
 Catuṣparśin, 233
 Catuṣpradeśika skandha, 290 91
 Cavendish, 237
 Cetana, 115, 117

- Cetanā, 10
 Cetanaśakti, 76
 Cetanaśakti-puruṣa, 174
 Cetanatattva, 12, 13, 14
 Chāyā, 12, 59, 202, 215
 Chedana, 48, 239
 Chinna, 234
 Cit, 14
 Citta, 13, 88, 265
 Cittaviprayukta saṃskāras, 58
 Cūrṇa, 214
 Cūrṇika, 214
 Darśanakāla, 28
 darśanāvaraṇīya, 99
 daśadravyaka, 265, 336
 daśasparśin, 233
 deśa, 239
 deśaija, 280
 deśāntaraprāpiṇigati, 179
 Dharma, 7, 16, 17, 22, 55, 57,
 64-66, 85, 97, 162, 167, 174,
 342
 dharma and adharma, 87, 97
 Dharmādharmaśāstra pudgalāḥ
 dravyāṇi, 18
 dharmadhātu, 58
 Dharmāstikāya, 12, 23, 24,
 220, 270, 274, 275, 282, 283
 Dharmāstikāyadeśa, 220
 Dharmāstikāyapradeśa, 220
 Dharmāyatana, 54
 dhātu, 26, 27, 64, 66
 dhātvantasamjñā, 64
 dhauvya, 174
 dhruvaśūnya-vargaṇā, 248
 dhruvavargaṇā, 248
 dhūmra, 59
 Digambara, 18, 255, 319, 321,
 322
 digbhāgabhedha, 111
 digbheda, 124
 Dik, 12, 22
 dik or diśā, 18
 Diñnāga, 146
 dīrghagatipariṇāma, 296
 doṣa, 87, 117
 dravatva, 158
 Dravya, 7, 8, 10, 16, 18, 23, 26,
 27, 30, 36, 131, 269
 Dravyakarma, 80, 81, 82, 86,
 91, 95, 96
 dravyaleśyā, 101, 104
 dravyamana, 196
 Dravyāṇi, 17, 18
 Dravyāṇi Jīvāśca, 17
 Dravyaparamāṇu, 129, 218,
 254, 256, 265
 Dravya paryāya, 7, 217
 Dravya-Sat, 23
 dravyasatya, 206
 dravyāśrita, 7, 8
 dravyatya, 24, 40
 dravyavāk, 193
 dravyendriya, 73, 75, 76
 dṛṣṭanimitta, 117
 duḥsparsāpariṇāma, 297
 durabhigandhapariṇāma, 295,
 297
 durabhigandhapariṇāta, 249,
 297
 durasapariṇāma, 287
 durūpapariṇāma, 297

dvaṇuka (dyad), 6
 dveṣa, 85, 87-89, 92, 97, 98
 dvipradeśika, 41, 334
 dvipradeśikaskandhas, 221,
 290, 291
 dvisparśin pudgala, 233
 Dvyidhikādiguṇānām, 319
 dvyāṇuka, 41, 48, 49, 113-14,
 124, 334
 dyad dvyāṇuka, 41, 48, 49, 53,
 113, 114, 325, 331, 333
 eguttariya, 327
 ekadeśin, 118
 ekānta, 127
 ekasamayavigrahagati, 179
 gandha, 32, 37, 54, 55, 57, 130
 gandhapariṇāma, 295
 Gati, 171
 gatikriyā, 179
 gatipariṇāma, 289, 295, 296
 ghana, 205
 Ghātaśarīra, 47, 161, 186
 ghaṭṭai, 179
 Ghoṣaka, 58
 Ghoṣaka, Bhadanta, 58
 ghrāṇa, 54, 57, 73
 ghrāṇendriya, 54
 Gommaṭṭisāra, 104
 Goṣaka, 56
 Gośāla Maṅkhaliputra, 105
 gotra karma, 99
 grahaṇam, 206
 grahaṇaguṇa, 44, 46
 grāhya, 234
 grāhya vargaṇā, 242

Guṇa, 7, 8, 10, 30, 36, 106,
 133, 138, 218-19, 330, 332
 guṇāmśa, 223
 guṇapariṇāma, 218
 guṇaparyāyātmaka, 10
 Guṇaparyāyavad, dravyam, 8
 Guṇa rajas, 106
 guṇasthāna, 104
 Guṇatamas, 106
 Guṇavaiśamyavimardda, 331
 guru laghu, 155
 gurutva, 157, 167
 Hadaya-vatthu, 55
 Haribhadrasūri, 10', 126
 hrasvagatipariṇāma, 297
 hrasvatva, 113, 114
 hṛdayavastu, 57
 Indriyas, 72, 73, 75
 indriya-ekatva, 75
 indriyagrāhya, 7
 indriyavinirbhāgi, 267
 indriyaviśayapudgala pariṇāma
 297
 iṣṭa, 111
 Īśvarakṛṣṇa, 331
 itaretarāśraya, 123
 ittham, 214
 itthindriya, 55
 Jaḍadravya of the Nyāya-Vai-
 śeṣika, 25
 Jaḍatattva, 12, 24
 Jagat, 13
 Jaghanyaguṇakālaka dviprade-
 śikaskandha, 222
 Jaghanya guṇakālaka paramāṇu
 222

- Jaina, 23, 28, 88, 266
 Jaina Āgamas, 16, 20, 27, 104, 276, 324
 Jainācārya, 28, 29, 46, 70, 72
 Jaina conception of Ākāśa, 22
 Jaina concept of matter, 32
 Jaina concepts of Rūpa, 32
 Jaina metaphysics, 7, 17, 18, 47, 59, 92, 125, 129, 131, 133-34, 141, 150, 151, 155, 159-61, 166, 174, 181-84, 200, 205, 211, 215, 217-18, 231-32, 254, 259, 264, 315, 343-44
 Jaina Paramāṇu, 225
 Jaina pariṇāma of matter, 310
 Jaina Paryāya, 218
 Jaina Paryāyavāda, 219
 Jaina philosophy, 20, 45, 63, 85, 218, 239, 340, 342
 Jaina Puṅgava, 44, 342
 Jaina school, 32
 Jaina sūtras, 3, 12
 Jaina system, 107
 Jaina systems of thought 31-33
 Jaina texts, 72
 Jaina tradition, 29
 Jaina tripradeśikakandha, 334
 Jaina viśrasā pariṇāma, 310
 Jaladhātu, 64, 65
 Jalam, 21
 jalīyasparśa, 167
 Jambū tree, 102
 janapadasatya, 206
 janya, 291
 Janya padārtha, 127, 259
 jarā, 57, 58
 jaratā, 55
 jāti, 223, 252
 jātimat, 203
 jatukāṣṭhavat, 123
 Jayanta Bhaṭṭa, 74, 175
 jihvā, 55, 57
 Jinakalpa, 104
 jīvendriya, 56
 Jiva, 12, 16, 17, 22, 171, 174, 270, 278, 342
 Jivadravya, 11, 16, 218, 342
 Jivadravyaparyāya, 217
 Jivagrāhya, 41
 Jivājīvaviśayabandha, 212
 Jivaparyāya 220
 Jivāśca, 17
 Jivāstikāya, 24, 275
 Jivatattva, 24
 jīvitendriya, 55, 57
 jñāna, 197
 jñānāvaraṇīya, 99, 101
 jñānāvaraṇīya-karma, 212
 jñeyatva, 10
 Kālikāro ābhāro, 55, 56
 Kadamba-flower, 77
 Kāla, 12, 16-18, 22-24, 30, 40, 254, 279
 Kalāpa, 232, 336
 Kālaparamāṇu, 254
 Kālavarnaparīṇāma, 295
 Kalpanā, 123
 Kāmadhātu, 266
 Kāmanā, 96
 Kampanakriyakāla, 179
 Kaṇāda, 116, 143

- Kapha, 26
 Kāpota, 102
 Kāpota leśyā, 106
 Kāraṇa, 100, 101, 227
 Kāraṇabhūtaguṇas, 10
 Kāraṇabhūtaśakti, 9, 10
 Kāraṇadravya, 123, 229
 Kāraṇaguṇapūrvakah kārya-
 guṇo dṛṣṭaḥ, 301
 Kāraṇāṇu, 255-56
 Kāraṇa paramāṇu, 226
 Karkaśasparśapariṇāma, 295
 Karkaśatā, 167
 Karma, 7, 42, 43, 48, 88, 92,
 93, 96, 103, 104, 212
 Karmabhāva pradhānavutpatti
 75
 Karmajñatā, 57
 Kārmaṇa, 7
 Kārmaṇa-pudgala parivarttas
 327
 Kārmaṇa śarīra 86, 88, 89, 90,
 91, 186, 189, 190-91
 Karmanīṣpatti, 91
 Karmanīṣyanda, 101
 Karmaphala, 91
 Karma-prakṛtipradeśa-bandha,
 104
 Karma-pudgala, 42, 79, 100
 Karmaraja, 218
 Karmasamjñā, 80
 Karmasthiti-anubhāga, 104
 Karmavargaṇā, 248
 Karmavargaṇā-niṣpaṇṇa, 101
 Karmendriyas, 73, 74
 Karṇa, 73
 Karṇaśaṣkuli, 73
 Kārya, 93, 117, 126-27
 Kāryadravyas, 50, 123, 229
 Kāryakāraṇa, 32, 88
 Kāryakāraṇa bhāva, 123
 Kāryaliṅga, 131, 228
 Kārya paramāṇu, 226
 Kāryatva, 19, 226
 Kaśāya, 84
 Kaśāyarasapariṇāma 295
 Kashmirian Vaibhāṣikas, 110
 Kaṭukarasapariṇāma, 295
 Kāya, 26, 27, 43, 55-57, 185
 kāyavijñapti, 57, 60, 61
 kāyavijñaptidharma, 60
 kāyavijñaptirūpa samsthānas,
 61
 kāyaviññatti, 55
 Kāyāyatana, 266
 kāyendriya, 78, 265-67
 kāyika, 60
 Kevalijñānin, 240
 kevalisamudghāta, 268-69
 khaṇḍa, 214
 khurupā, 77
 khuvvai, 179
 kleśa, 87, 88
 kliṣṭavṛtti, 88
 Kriyā, 38, 60, 61, 116, 172,
 178
 Kriyāyuktatantu, 116
 Kṛṣṇaleśyā, 105, 106
 Kṛtya, 98
 Kṛṣṇa, 98, 102
 Kṣaṇa samaya, 254
 Kṣaṇikaparamāṇuvāda, 126

- Kṣaṇikavāda, 108
 Kṣāyika, 100
 Kṣayopasāma, 78
 Kṣāyopasāmika, 100
 kṣetra, 30, 40, 41, 268-69
 Kṣetraparamāṇu, 254
 Kṣiti, 26
 KumārilaBhaṭṭa, 52, 95, 96, 108
 Kundabadaranyāya, 123
 Kundakunda, 16
 Kuśala, 97
 Kuśala citta, 58
 Kūṭasthanitya, 31, 133, 262
 Kūṭasthanityatattvas, 24
 Kuṭilagati, 178
 Labdhirūpa, 77
 Labdhirūpabhāvendriya, 78
 Laghutā, 57, 167
 Lakkhaṇa, 163
 Lakṣaṇarūpa, 55, 57
 Leśyā, 69, 101, 102, 105, 106
 black, -blue, -grey,
 lotus—red, 102
 —white, 103
 Leśyādravya, 101, 102, 104
 Leśyā pariṇāma, 218
 Limba, 76
 Liṅga, 226
 Liṅga śarīra, 88, 89, 91, 92
 Lobha, 92
 Loka, 30, 41, 138, 258, 275,
 281
 Lokānta prāpiṅgati, 179
 Loka-paramāṇu, 258
 Lokapramāṇa, 41
 Lokāyata, 27
 Madhurarasa pariṇāma, 295
 Mādhva, 68, 113, 125, 108
 Madhyama parimāṇa, 51
 madyabijānām pratyekam...
 310
 Mahābhārata, 105
 Mahābhūta, 57, 64-68, 79,
 116, 146-47, 267, 310
 Mahaddirghavadvā hrasva-
 parimāṇjalābhyā n, 115
 Mahat, 198, 234, 259, 263
 Mahāvibhāṣā 145, 146
 Mahāvīra, 20
 Manaḥ pariṇāma, 192
 manaḥ-pudgala parivarttas,
 327
 Manaḥ pudgala-parivartta-
 nirvarttanakāla, 328
 Manas, 18, 188
 Mānasaśakti, 75
 Mandatā, 84
 Manodravya, 245
 Manovargaṇā, 192, 195, 200
 Manu, 122
 Māṭharavṛtti, 72
 Matijñānāvaraṇa, 78
 Māyā, 25, 67, 94, 97, 310
 Māyāśakti, 13
 Milinda King, 93
 Militadravya saṁhatabhūtār-
 thā, 329
 Mīmāṃsā, 13, 51
 Mīmāṃsakas, 25, 52, 94-97,
 107, 108, 125, 161, 176,
 195, 203, 210, 309
 miśrabandha, 213

Miśraparināta pudgala,
 235, 236
 Moha, 85, 88, 92, 97
 Mohanīyakarma, 99
 mṛdu-kāṭhina, 155
 Mṛduta, 57, 167
 mṛśābhāṣā, 206
 Mūladravya, 7
 Mūlaprakṛtis, 99
 mūrta, 22, 34-36
 Mūrtagūṇas, 43
 Mūrtatva, 40
 Mūrti, 35
 Nabhavarganā, 248
 Naiyāyikas, 86, 143, 144, 145,
 147, 176
 Nāma, 13
 Nāma karma, 99, 196
 Nāmasatya, 206
 Naimittika kriyās, 80
 Naiyāyikas, 85, 794, 304-6,
 309-10, 335
 Navadravyaka, 336
 Nayavāda, 191
 Neo Naiyāvikus, 264
 Neo sthaviravādin, 146
 Nimbārka, 115
 nigoda śārīra, 187
 niḥsaraṇa, 206
 niḥsaraṇadravya bhāṣā, 207
 niḥśreyasa, 168
 nikācanā, 101
 nīla, 102
 nīla leśyā, 106
 Nimba, 105
 Nimbarka, 124

nimitta, 117, 118
 nimittakāraṇa, 330
 nimittanaimittikarūpa, 82
 nipphana, 55
 nipphanna rūpa, 56
 niravaya paramāṇu, 123
 nīreja, 280
 nirmāṇamanakarma, 76
 nirukti, 72
 nirvīṣeṣakāla, 269
 nirvṛtti, 76, 77
 Niścayanaya, 224, 230
 niṣkriya kāla, 179
 niṣpatti, 81
 Nityavasthitānyarūpāṇi, 17
 nivṛttisvabhāva, 119
 nodana, 302, 303
 Nyāya, 73, 85, 107, 125, 195
 Nyāya Philosophy, 151, 301
 Nyāyasūtra, 143
 Nyāya Vaiśeṣika, 12, 13, 19-
 23, 28, 31, 32, 43, 44, 50,
 52, 75, 87, 107, 108, 126-
 35, 140, 148, 150, 157,
 159, 160, 164, 166, 174,
 176, 180-81, 195-96, 202-4,
 210-11, 225, 231, 234, 239,
 259-60, 262, 264, 266, 284,
 331
 Nyāya Vaiśeṣika Metaphysics
 157
 Padārthāntara pratipādana,
 179
 padma, 102
 padmaleśyā, 106
 pāka, 66, 302

- pākādāna, 98
 Pākaja, 143, 302
 pākaphala, 98
 pākasthāna, 98
 pañca bhautika, 331
 Pañcabhūtas, 16, 25, 26
 pañca bhūtātmake, 331
 pañcadhātus, 16, 25
 pañcaskandhas, 16, 25, 26, 63
 pañcīkaraṇa, 129, 310
 Pāṇini, 71, 72
 pāpa, 97, 98
 parabhāga, 111
 parāghāta, 208
 parāghātabhāṣā, 206
 parāghāta bhāṣā dravya, 208
 paramakāraṇa, 124
 paramāṇeraniyatā, 179
 paramāṇu, 7, 28, 39, 40, 43, 47
 109-10, 116, 119, 122, 127-
 131, 133 138-39, 161, 220,
 222, 225, 229, 232, 238-39,
 254-59, 263, 265, 269,
 271-73, 278-79, 283 84, 286,
 288, 326
 paramāṇudravya, 226
 paramāṇukāraṇavāda,
 120, 124
 paramāṇu-pariṇāma, 268
 paramāṇu pudgala, 138, 140,
 255
 paraparyāya, 219
 parāśritajīvavāda, 14
 pariccheda-rūpa, 55, 57
 paricchinnatva, 299
 parimāṇas, 64
 parimāṇḍalya, 113-14, 264
 parimaṇḍala samsthāna pari-
 nāma, 295
 pariṇāma, 34-36, 104, 172,
 247, 269, 289, 310
 Pariṇāmavāda, 53, 218
 pariṇāmika, 100
 Pariṇāminitya dravya, 25
 parispanda, 300
 parispandana, 39, 173, 174,
 176-77, 181, 333
 parispandana śaktiguṇa, 39
 Parispandātmaka, 38, 171
 pārthiva sparśa, 167
 Partington, 237
 Paryāpanna, 58
 Paryāptika, 206
 Paryāptika bhāṣā, 206
 Paryāya 10, 30 61, 133, 138,
 218-19, 291
 Paryāyaparāmparā, 219
 parpāya sadṛśa, 219
 Paryāyavāda, 219
 Paryāya visadṛśa, 219
 patana, 157
 Patañjali, 105, 156
 Paudgalika, 85, 194
 phoṭṭhabba, 57
 Pillu-aṇus, 303
 pīlupāka 302, 309, 335
 Pīlupākaja, 303
 Piṇḍa, 111
 piṇḍaḥ syādaṇumātrakaḥ, 110
 pipāsā, 167
 pitakas, 27
 pītavastu, 65

- piṭhara, 304
 piṭhara pāka, 302, 309, 335
 Piṭharapākaja, 304, 309
 pitta, 26
 Poggharaṇa, 164
 Poggharaṇa svabhāva, 163
 Pobatta, 77
 Prabhākara, 52, 108
 pradeśa, 99, 104, 239, 274,
 324-25
 pradeśātmakatā, 232
 Pradeśatva, 10, 24, 169
 Pradhāna, 122
 Pradhānakāraṇavāda, 122
 Pradīpikāvṛtti, 172
 Prajñākara, 93
 Prajñāpanā sūtra, 221, 249
 Prakṛti, 7, 8, 12, 13, 25, 72,
 90, 93, 99, 104, 108, 135,
 173-74, 198, 298
 Prakṛtic, 89
 Prakṛti pariṇāma, 218
 prakṛti-pradeśabandha, 104
 Prakṛtitattva, 31
 Prakṛtivāda, 32
 Pralaya, 116, 120
 prameyatva, 24
 Prāṇa, 200
 Prāṇāpāna, 188, 200
 prāṇendriya, 194
 prāṇitattva, 24
 prāṇaṇa, 48, 239
 prāpyakārī, 151
 prasāda rūpas, 57
 prasarpaṇa, 65
 Praśastapāda, 86, 87, 125
 333-34
 pratara, 214
 pratighāta, 111, 282
 Pratighātātva, 283
 pratighātin gati, 178, 284
 pratikṣaṇa pariṇāmin, 61
 Pratiṣṭhita, 187
 pratyaya-sarga, 90
 pratyeka, 187
 pratyekaśarīravargaṇā, 248
 Pravacanasāra, 172
 Pravalatāpūrvaka prerāṇa, 179
 pravṛtti 83, 85, 96, 117
 pravṛttisvabhāva, 119
 prayatna, 117
 prayoga pariṇata, 236
 prayoga pariṇata pudgala,
 235, 236
 prayogavāsanāyogyadravya, 208
 prayoga visrasā, 213
 prāyogika, 205, 212, 218
 prāyogika śabda, 205
 prāyogyajaghanya vargaṇā,
 244
 Prout, J. L. 136, 137
 pṛthivī, 18, 21
 pṛthivīdhātu, 64, 65
 pṛthivīkāya, 48, 184
 pṛthivī paramāṇu, 131
 pṛthivī tanmātra, 50
 Pudgala, 12, 13, 16, 17, 22,
 25, 29, 30, 33, 37, 39, 47,
 48, 69, 82, 86, 154-55, 171,
 289, 342

Pudgaladravya, 17, 18, 20, 36,
 80, 86, 91, 169, 229
 pudgalagati, 276
 Pudgalajīvaṣṭu kriyāvantah
 38
 pudgalaparivartta, 326
 pudgalaskandha, 48, 239, 255
 Pudgalāstikāya, 12, 24, 28
 pudgalavargaṇā, 247, 248
 puṇya, 97, 98
 Purāṇam kham, 173
 Purisindriya, 55, 56
 Puruṣa, 12, 24, 88, 91, 95,
 176, 198
 Puruṣādhiṣṭhita, 92
 puruṣatva, 57
 Pūrvajñānarūpama, 199
 Pūrvakapraveśa, 179
 Pūrva Mīmāṃsakas, 73, 75,
 194
 Pūrvāparabhāva, 81
 pūrvaparyāya, 219
 Rāga, 85, 86, 88, 97, 98
 Raghunātha Śiromaṇi, 2, 4
 Rāhul Sāṅkṛtyāyana, 63
 Rajas, 7, 59, 99, 133, 259
 Rāmānuja, 113, 115, 124
 Rāmānuja school, 14
 rasa, 32, 39, 54, 55, 57, 130,
 330
 rasasā, 73
 Rasanendriya, 54
 Rasapariṇāma, 139, 295
 Rasavyāpāra, 151
 Rāśi, 232
 Richter, J. B., 136

Rjudgati, 178
 rūkṣabandhana pariṇāma,
 296, 317
 rūkṣa sparśa rasa pariṇāma,
 295
 rūkṣatva, 316, 338
 Rūpa, 10, 13, 25, 32, 35, 47,
 54-58, 63, 64, 66, 73, 92,
 109, 112, 130, 166, 215,
 265, 267
 rūpadarśana, 61
 rūpādibhirasamūtaṁ, 299
 rūpapariṇāmi guṇas, 34, 36
 rūpaprāsāda, 78
 rūparasagandhānuṣṇasparśa
 śabda, 301
 Rūpasamghāta, 265
 Rūpasatya, 206
 Rūpaskandha, 54, 56, 167
 Rūpassa aniccata, 55
 Rūpassa jaratā, 55
 Rūpassa kammaññatā, 55
 Rūpassa lahitā, 55
 Rūpassa madutā, 55
 rūpassa santati, 55
 Rūpassa upacaya, 55
 Rūpātmaka, 32
 Rūpatvaguṇa, 37
 Rūpatvaguṇasamavāya, 37
 Rūpajīvadravayas, 12
 Rūpajīvaparyāya, 220
 Rūpin, 34-36
 Rūpiṇaḥ pudgalāḥ, 54
 Rūpitva, 36, 37
 Russel, Prof. Bertrand, 10
 Śabarasyāmin, 210

Śabda, 54, 55, 57, 202, 205
 Śabdapariṇāma, 295, 297
 Śabdāyatana, 266
 śaḍamśatā, 110
 Śadbhāva, 104
 Sādhāraṇa, 187
 Sadṛśa, 317
 Sadṛśabandhana, 317
 Sadṛśapariṇāma, 174
 Sajāttīya saṃyoga, 329
 Sajāttīyopastambha, 329
 Śakti, 95, 175, 311
 Samānaguṇas, 52
 samānajāttīyasamīyogah
 dravyārambhakaḥ, 301
 Samānajāttīyotpatti, 310
 sāmānya, 187
 Sāmānyaguṇas, 44
 Samatā, 115
 Samavāyin, 117
 Samāveśa, 93
 Samavāya, 37
 Samaya, 153, 279-81, 316
 Sambhūyakriyā, 310
 sambhūyakriyā samutthāna,
 310
 Saṃghabhadra, 146, 265
 Saṃghāta, 111, 293-94,
 Saṃghātabhedebya
 utpadyante, 256
 Saṃghātaguṇa, 169
 Saṃghātaparamāṇus, 110,
 111-12, 232, 260, 265 68,
 336-37
 Saṃhatabhūta-dharma, 310
 Samita, 178, 277

Samita kampana, 179
 Sāmkhya, 7, 8, 12, 22, 24, 28,
 31-33, 53, 66, 67, 72, 74,
 89-92, 106, 108, 129, 133-
 135, 151, 156-57, 173-74,
 196-98, 218-19, 299, 310-
 311, 331-32
 Sāmkhya Bhūtādi, 173
 Sāmkhya-Patañjali, 331, 332,
 Sāmkhya philosophy, 73, 117,
 189, 202
 Sāmkhya prakṛti, 7
 saṃkhyātāṇuvargaṇā, 241
 saṃkhyātapradeśika, 233
 saṃkhyāta pradeśika skandha,
 290
 Sāmkhya view, 91
 Sāmkhya view of pariṇāma,
 174
 Sāmkhya yoga, 49, 50, 67,
 107, 125, 127, 194, 225,
 258, 260, 298
 saṃkleśa, 103, 213
 Saṃskāras, 13, 85-88, 93, 95
 Saṃskāraguṇa, 86
 Saṃskāra karma, 93
 Saṃskṛtadharma, 63
 saṃsthāna, 37, 60, 64, 101,
 202, 214
 Saṃsthāna avayava, 311
 Saṃsthāna darśananirapekṣa,
 62
 Saṃsthānapariṇāma, 139, 295
 Saṃsthānātmaka, 60
 saṃsthānaviśeṣātmaka, 60
 samudghāta, 101, 268

- samyagsatya, 206
 sāmāyavasthā, 174
 samyoga, 111, 116, 119, 122,
 316
 sandhāraka, 63
 śāṅkarabhāṣya, 146
 sānnidhya, 115
 sannipātikabhāva, 100
 sanniveśa, 167, 311
 Santānas, 7
 Sāntaranirantaravargaṇā,
 248
 Santati, 55, 81
 Sapatigha, 93, 161
 Sapatigha rūpas, 265
 Saptadravyaka, 336
 Śarga, 90
 Sarīra, 188
 Śarīrabandha, 213
 Śarīrī bandha, 213
 Sarvadravyas, 17
 sarvaija, 280
 Sarvārthasiddhi, 18, 104, 320
 Sarvāstivādin, 145-46, 267
 sarvasūkṣmarūpa saṁghāta
 265
 sarvātmaka, 118
 Sat, 37
 Satkāryavāda, 122
 Sattva 7, 67, 133
 Satvastu, 12
 Satyabhāṣā, 206
 Saukṣmya, 202, 214
 Sautrāntika, 93, 108, 125, 128,
 141, 145, 147
 sāvayava, 123
 Sāvayavadravyas, 116
 Sāvayava dvyaṇuka, 123
 Sāvayava Saṁghāta, 111
 Sāvayavatva, 118
 Scheole 237
 Seal, B. N., 156, 172, 260,
 299
 Shah, S. M., 29
 Siddhasena Gaṇin, 35, 36, 125
 151, 172
 Śīta uṣṇa, 155
 Śītatva, 167
 Skandha, 7, 26, 39-41, 126-
 127, 133 34, 220, 225, 226,
 228-33, 238-39, 256, 270-
 271, 274, 277, 279-80, 283,
 290-91
 Skandhadeśa, 220, 231, 238
 Skandhaparyāya, 228
 Skandhapradeśa, 220, 231,
 238
 Skandharūpa pariṇāma, 228
 Snchakāyatva, 169, 316
 Snigdhabandhanapariṇāma,
 296, 317
 snigdha rūkṣa, 155
 Snigdharūkṣatvadbandhaḥ 294,
 317
 Snigdhatva, 316, 338
 Snigdhatvarūkṣatva, 316
 Sota, 55
 Spandana, 179, 285
 Sparśa, 32, 37, 75, 130
 Sparśagati pariṇāma, 296
 Sparśapariṇāma, 139, 295
 Sparśatā, 273

- Sparśendriya, 75
 Sparśendriya viṣaya pudgala
 pariṇāma,
 Sphuṭārthā, 59
 Spinoza, 341, 342
 Spraṣṭavya, 54, 57, 167-68
 Sprṣṭagati, 179
 śravaṇendriya, 54
 śrotra, 57
 śrotrendriyaviṣayapudgala-
 pariṇāma, 297
 Sthāna, 99
 Sthānapariṇāma, 296
 Sthāpanāsatya, 206
 Sthaulya, 202
 Sthavira, 58
 Sthiratvavāda, 107
 Sthiti, 99
 Sthitisthāpakatva, 44
 Sthūlatvapariṇāma, 292
 Strīva, 57
 Śubha, 97, 235
 Sugata, 72
 Śukla, 98, 102
 Śukla-kṛṣṇa, 98
 Śuklaleśyā, 106
 Śuklavarna pariṇāma, 295
 Śūkṣma 93, 175, 232, 236,
 239
 sūkṣma bādara, 239
 Sūkṣmabādara pudgala skan-
 dha, 48
 sūkṣmabbūtas, 67, 68, 173, 331
 Sūkṣma paramāṇu, 128, 130-
 131
 Sūkṣma pariṇata anantaprade-
 śika skandha, 233
 Sūkṣmaśīrīra, 331
 Sūkṣma sūkṣma 49, 239
 Sūkṣmatvapariṇāma, 292
 Śūnyavādin, 94
 Śūnyavargaṇā, 248
 Surabhigandhapariṇāma,
 295, 297
 Surabhigandha pariṇata, 249
 Surabhiśabda pariṇāma, 297
 Surasapariṇāma, 297
 surūpapariṇāma, 297
 suṣira, 205
 Susparśapariṇāma, 297
 Sūtra Ekapradeśādisubhājya
 pudgalānām, 41
 Svabhāva, 56, 57
 Svabhāva rūpas, 56
 Svābhāvika pariṇāma, 310
 svānugata, 116
 svāśraya-āṇu, 116
 Svatantrajīvavāda, 14
 Svatantratā, 117
 Svetāmbara, 17, 255, 296,
 319
 Syāt kāraṇa, 228
 Syāt kāryalinga, 228
 Tadantyaṃ kāraṇaṃ, 126
 Tadātmaka paramāṇu, 111
 Tadetadrūpa kṣaṇa, 218
 Taijasa, 7
 Taijasa-pudgala-parivarttas,
 327
 Taijasa pudgala parivartta
 nirvarttanakāla, 328

- Taijasaśarīra, 189-91
 Taijasasparśa, 167
 Tamas, 7, 133, 202
 Tanmātra, 50, 67, 107, 108,
 125, 127, 156, 173, 202,
 218, 259, 299, 300, 331
 Tanmātric, 89, 90
 Tata, 205
 Tattvārthādhigamabhāṣya, 71
 Tattvārthādhigama sūtra, 17,
 18, 35, 71, 125, 151, 290,
 320-21
 Tattvārtha Rājavārtika, 18,
 172
 Tattvārtha Śloka-vārtika, 18
 Teja, 18, 26, 56, 102
 Teja-kāya, 48, 184
 Teja paramāṇu, 131
 Teja tanmātra, 50
 Tejodhātu, 57, 64, 65
 Tejo leśyā, 106
 Theravāda school, 55
 Tithindriya, 56
 Tiktaraśa pariṇāma, 295
 Tirthaṅkara, 72
 Tiryag gati, 159, 179
 Traikālika, 8, 9, 138, 256
 Traikālika paryāyas, 8
 Taikālikāsti, 35
 Trasakāya, 48, 188
 Tripradeśika, 41
 Tripradeśika skandha 290-
 291, 334
 Tripuṭikā, 73
 Trisparśin, 233
 trṣṇā, 96
 tryaṇukas, 113, 334
 Tvak, 73
 Udbhūtarūpa, 263
 Udvartanā, 100
 Udraṇā, 100
 Udyota, 202, 216-17
 Udyotakara, 145, 209
 Umāsvāti, 28, 34, 42, 125, 316
 Upacāra, 80
 Upacaya, 55, 118
 Upacaya upacaya, 57
 Upādānabhūta jñānakṣaṇa,
 198
 Upādāna karaṇa, 329-31
 Upādāna upādeya-rūpa 82
 upādāya rūpas, 57
 upagraha, 43
 upakārābhava-ratighāta, 283,
 288
 upakārṇa, 76
 Upaniṣads, 27
 upaniṣadic period, 25
 upapatti, 101
 upaśamana, 100
 upaṣṭambha, 330, 331
 upayoga, 10
 upayogarūpa, 77
 upayoga rūpa-bhavendriya, 78
 ūr'hvagati, 179
 utkara, 214
 utkarabheda pariṇāma, 297
 utkṛṣṭagati, 179
 utkṛṣṭaguṇakālakaparamāṇu,
 222
 utpāda, 23, 24, 174

- utsarpiṇī kāla, 328
 uttara prakṛtis, 99
 Vācaspati Miśra, 74
 vacIviññatti, 55
 vāgvijñāpti, 57
 Vaibhāṣika, 22, 58, 60, 108,
 109, 125, 128, 141, 145,
 147, 164-66, 215, 337
 Vaibhāṣika doctrine, 59
 Vaibhāṣika philosophy, 59
 Vaibhāṣika school, 54, 59-61,
 184, 202
 vaibhāṣika texts, 63, 64, 65
 vaibhāṣika view, 62
 vaibhāṣika yogācāra, 58
 vaikriya pudgalaparivarttas,
 326-28
 vaikriya pudgala parivartta-
 nirvarttanakāla, 328
 vaikriyika grahaṇa-vargaṇā,
 247
 vaikriyika śāstra, 189, 242-43,
 327
 vaimanika, 327
 Vaiśeṣika, 7, 52, 86, 107-9,
 113-16, 118-21, 123-25,
 127, 131, 144, 145, 150,
 165-167, 180, 194-95, 199,
 197, 209, 301, 303-4,
 307-9, 333, 335
 vaiśeṣika doctrine of intran-
 sitive causation (Ārambha-
 vāda), 51
 vaiśeṣika-nyāya, 125
 vaiśeṣika philosophy, 13, 133,
 143
 vaiśeṣika principle, 113
 vaiśeṣika school, 18
 vaiśeṣika system, 51
 vaiśeṣika tryaṇuka, 334
 vaisrasika, 205, 212
 vaisrasikabandha, 213
 vāk, 188, 192-93
 vāk pudgala-parivarttas,
 327-28
 vākpuḍgalaparivartta nirvart-
 tana kāla, 328
 Vallabha, 125
 Vanaspatikāya, 48, 187
 Vargaṇā, 223, 241-46
 Varṇa, 37, 60, 130
 Varṇaparīṇāma, 139, 294-95
 varṇātmaka, 60
 Vāsana, 88, 93, 94, 97, 208
 Vastutva, 24
 Vasubandhu, 58, 109-111,
 146, 219
 Vāta, 26
 Vātsyāyana, 125, 143
 Vāyāvṛtya sparśa, 167
 Vāyu, 18, 21, 26, 116
 Vāyudhātu, 57, 64, 65
 Vāyu-kāya, 48, 184
 Vāyu paramāṇu, 300
 Vāyuraṃ khaṃ, 173
 Vāyu tanmātra, 50
 Vedanā, 98
 Vedāṇīya karma, 99
 Vedānta, 12, 13, 14, 24, 67,
 68, 73, 107, 123, 194, 311,
 332
 Vedānta philosophy, 7
 Vedāntin Madhva, 108

- Vedāntist, 68, 113
 Vega, 157, 285
 Vegapratighāta, 283, 287
 vibhajya, 130
 Vidyānanda, 126, 151
 Vighraha, 178
 Vighrahagati, 279
 Vijāṭīya samyogaḥ, 301, 329, 332
 Vijāṭīyotpatti, 310
 Vijñāna, 13, 62, 110
 Vijñānabhikṣu, 331
 Vijñānarūpa, 198
 Vijñānātmaka, 194
 Vijñānavādin Buddhist, 93, 108, 113
 Vijñapti, 62, 109, 110
 vijñaptirūpa, 57, 93
 Vijñaptisvabhāva, 61, 62
 vijñaptimātratāsiddhi, 108, 109, 112
 Vikāra rūpas, 55, 57
 Vikalendriyajīvas, 327
 Viṃśatikā, 109
 Vinayavijayajī Śrī, 126, 230
 Viśadṛśa, 317
 Viśadṛśabandhana, 317
 Viśakalita avasthā, 291
 Viśeṣa pariṇata pudgala, 235, 236
 Viśvarūpa, 49
 Viśveśa rūpas, 44
 viśiṣṭa pariṇāma, 36
 Viṣṭambha, 331, 330
 viśreṇi, 178, 182
 Visuddhimagga, 54, 56, 71, 92, 97-98
 vitata, 205
 Vivakṣitabhāva, 268
 vividha kampana, 179
 Vividha, 178
 vṛtti, 66, 91
 Vṛttigrantha, 63
 Vyākaraṇa sūtra, 72
 Vyākaraṇa vṛtti, 72
 vyakta avasthā, 174
 Vyañjanaparyāya, 38
 Vyāpāra, 172
 Vyavahāra, 129, 229
 Vyavahāra paramāṇu, 128, 131
 vyavahārika, 229
 Vyavahārika paramāṇu, 232
 vyāvṛta, 54
 vyaya, 23, 24, 174
 vyūha, 334
 vyūhana, 331
 vyūhanavṛtti, 65
 William James, 99
 Wohler, 237
 Yaśomitra, 63
 Yoga, 12, 83, 85, 87, 88, 93, 96, 218
 Yogācārins, 58, 146
 Yogadarśana, 98
 Yoga philosophy, 87
 Yogapariṇāma, 101
 Yoga-pravṛtti, 104
 Yoga School, 266
 Yoga vargaṇā, 102
 Yogavyāpāra, 84
 Yutasiddhāvayavāḥ samūhaḥ, 329
 Zimmer, Dr. 106

